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# HEALTH SEEKERS IN SOUTHERN CALIFORNIA

WILLIAM A. EDWARDS, M.D.
AND
BEATRICE HARRADEN

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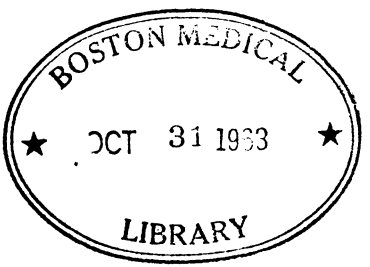


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# TWO HEALTH-SEEKERS IN SOUTHERN CALIFORNIA

By

WILLIAM A. EDWARDS, M.D.

FELLOW OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA, ETC., ETC.

AND

BEATRICE HARRADEN

AUTHOR OF "SHIPS THAT PASS IN THE NIGHT," ETC.

PHILADELPHIA

J. B. LIPPINCOTT COMPANY

1897

22273

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IT PLEASES ME TO DEDICATE THIS

LITTLE BOOK

TO MY LIFE-LONG FRIEND,

GEORGE E. DE SCHWEINITZ, M.D.,

IN MEMORY OF MANY DAYS THAT
WERE HAPPY AND SOME, PERHAPS AS PLEASANT
TO REMEMBER, THAT WERE SAD.

W. A. E.

SAN DIEGO, 1896.

# PREFACE

I HAVE long felt that an impartial account of Southern California, devoid of the fulsome praise of guide-books and land-office advertisements, would be of interest and help to a large class of health-seekers.

If invalids would bear in mind that no climate is perfect, much disappointment would be saved.

Again, if physicians would explain to their patients the absolute necessity of coming earlier in their disease, much suffering could be avoided.

Finally, if the general traveller were made to understand that he was coming to the arid belt of America, with its scant and uncertain rainfall, many complaints of barrenness would cease.

Miss Harraden has kindly contributed

the first and fourth chapters of this little book, in which she expresses her opinions formed after a residence of nearly two and a half years. The remaining chapters are my conclusions after a residence of eight years. Neither of us assumes responsibility for the statements of the other.

W. A. E.

SAN DIEGO, September, 1896.

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# TWO HEALTH-SEEKERS
IN
# SOUTHERN CALIFORNIA

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## CHAPTER I.

### SOUTHERN CALIFORNIA.

SOUTHERN CALIFORNIA has to be known well before it can be loved, and even when thoroughly appreciated for its many delightful characteristics, there will often remain certain of its peculiarities which may perchance jar on the sensitiveness of those accustomed to the tender charms of a more caressing land. On the other hand, the real beauties and advantages of the country and climate are so obvious that one need not hesitate to draw attention to some features likely

to prove a little disappointing to any new-comers who are looking for a land of waving palm-trees and rich natural luxuriance and generous growth of green. Green there is, and of the brightest emerald the eye might wish to see; but it passes all too swiftly, burnt up by the downpour of golden sunshine, and gives place to every shade of delicate brown and amber which one learns to like well enough, only not as one loves the blessed green. Palms are there also, but not growing at random, as some of us may have feverishly fancied; man's hand must plant and tend them, and water them unceasingly. As for the rich luxuriance, it is there also, or rather one should say that the possibility of it is there under the dusty soil, waiting only for our help and labor to give it a development which for fulness and rapidity is nothing less than miraculous. Indeed, one of the greatest pleasures in

Southern California is the power which we all possess, if we only choose to use it, of transforming the brush-grown plains and hills into a fair and fruitful garden land. It is almost like a fairy-story to see what wonders may be wrought from the very onset, and to mark how soon the willing earth answers to an honest care. But she demands devoted and hard work, —not the mere scratching of the ground and the smoking of a cigarette; and perhaps it is not out of place here to insist specially on the truth of this statement for the benefit of those who have any idea of coming to Southern California and taking up the onerous duties of ranch life. It is one thing to "*have done a little gardening at home*," toying, no doubt, with a spade and a rake and a watering-can, and quite another thing to start a fruit-farm, to follow a plough or cultivator over virgin soil, and wield a heavy hoe all day long, in the fierce heat

and glare of the sun, and to evolve and carry out some scheme of irrigation which often of necessity entails endless trouble and anxiety. These are not light tasks, and should not, therefore, be undertaken lightly; but a judicious fulfilment of them assures success to a man who has been wise enough to content himself with a small ranch; for it seems to be established beyond any question that small ranches conducted in a business-like fashion have every chance of yielding fair returns, whereas the larger fruit-farms involve too much work and too much money. Quite apart, however, from pecuniary considerations, country life in the South of California has a great deal in it which is very delightful: the riding and driving, the sense of unrestrained freedom, the pleasure in the wide-stretching plains and rolling foothills, and distant ranges of mountains, bare and uncompromising on a first in-

troduction, but taking on rare charms of light and shadow and southern glamour, when once the slight acquaintance with them has ripened into friendship. Then there are the excursions by moonlight, the sleeping out of doors, the fragrances in the air wafted from the orange and lemon blossoms, and in the spring-time from the myriads of wild flowers which, when aided by the winter rains, leap into luxuriance charged with divers sweetnesses. But if the rainy season has been a niggardly one, then we must needs content ourselves with a few poor stragglers who serve just to remind us of the treasures of gold and blue and red and yellow and purple and white laid at our feet in such profusion during a previous year. Then we must dream of the fields of the flaming eschscholtzia, the California poppy, seen to perfection perhaps on the foot-hills of the San Gabriel valley,

and covering the ground there and elsewhere with a rich orange mantle; we must dream too of the masses of brodiæa, pale lavender in hue, toning in so softly with the numberless yellow flowers: the yellow violet with its peculiar Oriental fragrance, the gentle little cream-cups, paler than our beloved English primrose: the marguerite of varying shade and form: the handsome leptosyne with its brown velvet centre and its strong vanilla perfume, and scores of others springing up to take the place of those which die down all too quickly. We must pay due tribute also to the rich indigo larkspur, the lupins and vetches, the brown and mauve lilies, the gilias, the red painter's brush, the wild pea of brilliant pink, the delicate shooting star with petals of white tinged with purple, the tiny baby-blue eyes, one of the nemophila family, white flowers, as many as you like, and some of them as wee as a pin's head,

and the pretty little blossoms of the alfilaria, which together with the blossoms of the elderberry are the welcome harbingers of spring. Later on in the season and in different parts of the State we shall find other treasures: the Mariposa lily, so called because of its likeness to a butterfly, and the Romneya, a monster poppy of crinkled white satin, and the thistle, a handsome and stately fellow indeed, and countless others, some of them known only to those of us who are able to climb up steep places or dive into deep cañons; for one has to be fairly strong to be a good botanist in Southern California. It is not enough to have a penetrating eye; one must be able to bear fatigue and heat and glare, and to have enough enthusiasm to fight one's way through the dense chaparral, and enough caution to be on one's guard against those evil-looking fiends, the rattlesnakes, which kill so easily, but

which themselves are so easily dispatched. If, however, owing to a dry winter, we have been cheated of these many lovely wild flowers, there at least remain certain consolations which are not likely to fail us: the sumac will, in spite of drought, continue to put out its tender shoots; the chillicote with its bright fresh leaf and delicate white blossoms will spread itself elegantly over anything within its reach; the uncompromising cactus will eke out its grim existence, offering us as a sort of an apology its most exquisite flowers, some yellow and some red. Various kinds of sages are found in profusion, especially in the more southern parts of the State; we shall find also the Spanish dagger, or yucca, the manzanita, the mountain mahogany, with its stubborn roots, the very despair of those who have the irksome task of clearing the brush-grown ground; and higher up,

the scrub oaks, and the grease bush, and lower down again the cucurbita or gourd, commonly called mock-orange, and the datura meteloides, a large pale violet flower full of delicious fragrance. In the valleys and cañons near the river, or what is called the river,—for we should scarcely realise that it is such until the winter rains swell the mountain torrents and rush down with overwhelming force into the dried-up river-bed,—in these valleys and cañons we shall find most comforting stretches of green even during the hot summer: sycamores and cottonwood trees, a few live oaks, abundance of willows, grasses and reeds, wild roses, and a perfect luxuriance of the wild grape-vine, which drapes itself artistically over trunks and branches and climbs as high as it desires. Up in the mountains, of course, we come into a totally different country and scenery; live oaks and pines abound everywhere,

and we therefore may not give the epithet of treeless and barren to this portion of Southern California. Water is found there without stint or measure, and the climate bears little or no resemblance to that of the plains and foot-hills below. Hence many people who miss the procession of the seasons and feel the need of a bracing change find their way into the mountains during some part of the year; and if they are strong enough to enjoy camp-life, or rich enough to take servants with them to see to all the details of the little establishment, then they will come back greatly invigorated, especially if they have had the pride and satisfaction of laying low some harmless deer. But camping for frail folk is a mistake; and doctors, far away from these scenes, sitting comfortably in their arm-chairs, with all their needs luxuriously attended to, are apt to give out this order much

too thoughtlessly. They have not themselves tried it perhaps, except under more favourable conditions than those which some of their patients might be able to command.

In speaking of the scenery in Southern California, one must certainly not forget to mention the enormous granite boulders and lavish supply of stones, interesting no doubt to the geologist, but the despair of the fruit-grower and of some lovers of beauty. Mrs. Collier Graham, in her charming little volume "Stories of the Foot-Hills," makes one of her characters refer thus to the soil: "He said the soil was good. An' I 'lowed it was,—what there was of it; and so was boulders good, for boulders—the trouble was in the mixin'. Don't talk to me about your decomposed granite; it's the granite what ain't decomposed that bothers me!"

That exactly describes the feelings

of any rancher who happens to be the unfortunate possessor of too many boulders. And as features of the landscape they are only tolerable when, after sunset, that beautiful rosy glow quite peculiar to the South holds them in a tender embrace; then they are softened and glorified if only for a passing moment; and those of us who come from a land of purple heather may well believe that these barren stones have suddenly burst out into blossom: just for the passing moment, nature's compensation. But the next day in the full glare of the sun there is nothing romantic or picturesque about them. One may drive for miles in some parts, and see nothing but stones and boulders and dried-up brush and shabby-looking cactus, and dust without beginning or end. The dust in Southern California, in summer-time after a dry winter is really quite overwhelming; it not only

eats into one's clothes, but corrodes one's temper as well, and gets into one's nose and throat and chest. It rises up into the buggy in great curling waves, thickly powdering every one from top to toe. Enthusiastic Californians pretend not to notice it, but it exists all the same, even although it is not mentioned in the guide-books! It seems almost impossible to realise that beautiful flowers of every different form and hue are nestling beneath this ugly covering. When one sees it at first, one may well be forgiven for asking, "Can any good come out of Nazareth?" But in spite of dust and boulders and burnt-up brush and heat and glare, there are many delightful things in Southern California even during the hottest summer: then it is that the mountains look at their very best towards the hour of sunset and after the setting of the sun, all the crudeness and harshness of their

features being tempered and softened by the tender glow and glamour. Then it is that we most enjoy the lovely moonlight evenings, and then too we know that we may reckon on the coolness of the nights. So whilst in other parts of America people are stricken down by the summer heat of both day and night, out here in Southern California prostration from the heat is rarely heard of, and certainly never on the coast; and moreover there is something in the climate which peculiarly aids recuperation from any kind of exhaustion. It is quite possible that new-comers from cooler and damper regions—who have not had to contend with the great extremes of cold and heat experienced in most parts of the United States,—new-comers from England, in fact, and other countries of Europe, may find the dry heat extremely trying. It is undoubtedly hard on the brain and

the nerves, and any invalids suffering from the effects of overwork or from weakness of the nervous system should be strongly advised, if they come to Southern California at all, to make their home on the coast, or not too far inland, so as to be within reach of the breeze which throughout the summer sweeps with unfailing freshness over from the ocean. And speaking of the ocean reminds one that nothing one could dream of could be more beautiful than the blue waters of the Pacific with its most lovely fringe of snow-white surf. It is almost one's idea of purity and perfection. It is a smiling, dancing sea with life and light and love of sunshine; and all the exquisite tints of a Californian sunset are caught by the glistening foam, which then exchanges its wonderful whiteness for all the fairy colours of mother of pearl. To sit on the rocks and watch this sea is a joy in itself; and for those

who like to pry and probe, there are the fairy pools lined with every shade of delicate and rich green and pink and heliotrope, and inhabited by numberless crabs, all of them in handsome attire well suited to their most artistic homes. Seals will sometimes sport around, barking loudly to each other; goldfish flash by, their burnished coats glistening in the sunshine. Grave and stately pelicans fly overhead; cormorants and seagulls hasten to and fro, or linger on the broad stretch of kelp to do their fishing. These wide belts of kelp are quite peculiar to the Pacific coast; they seem to be like great fields of golden-brown strands of leaves and berries swaying with the movements of the waves. Even the large steamers do not attempt to cut their way through them, so dense is the growth anchored firmly to the ocean-bed. But, leaning over the side of the vessel, it is a great pleasure to

see such an expanse of rich colouring toning in so harmoniously with the beautiful blue of the ocean; and to those of us who love to observe the many charming expressions of Nature, this scene will perhaps be one of the pleasantest memories of the sea journey from San Francisco down to the south. Some people consider that this is the most agreeable way of reaching the southern part of the State; and indeed if the weather is fine, as it usually is, the voyage is nothing else but a pleasure trip. Immediately after passing Point Conception, we realise that we have come into a Southern clime; and we almost seem to see a distinct line of demarcation separating the northern gloom from the southern glamour. Then at once we begin to see the porpoises playing about, and the flying-fish springing out of the water, and looking just like rainbow gossamer as the sunlight

catches them. Then we begin to have exaggerated hopes of the beauty of the country awaiting us; for all unconsciously we are filled with a sensuous delight in the genial warmth and glow and tender colouring. As we approach nearer, however, we at once miss the green, and this is especially true of San Diego, and all the more to be regretted since there is no reason why every town in the south should not be a living mass of trees, nor why San Diego herself, with her wonderful harbour and her beautiful natural situation, should not become a very queen among cities. In a land where peppers, eucalyptus, acacias, magnolias, rubbers, palms, Norfolk Island pines, and camphors grow up with breathless speed, there seems little or no excuse for not taking every opportunity of making ideal surroundings and conditions for a town the climate of which both in summer and

winter is well-nigh perfect. A great deal has of course been done for this city and other cities too in Southern California, and some of us, less patient perhaps than is seemly, require to be reminded frequently that the country is only in its infancy; but for all that, we persist in saying that, considering the easy possibilities, not half enough has been attempted or carried through. But every season makes a difference now; people who love beauty and will have it are finding their way to San Diego and raising their standard there, and before very long the rose-gardens of pretty, sleepy Santa Barbara will find some dangerous rivals. Before very long, too, pride and public spirit will surely conquer hindering circumstances, and then we may look for cooling fountains and green resting-places and plenty of shade and a generous supply of easy benches either for the invalids

or the indolent, and perhaps a beautiful boulevard sweeping round the whole extent of the bay and making a noble drive such as few cities in the world could command.

With regard to the choice of any special part of Southern California for permanent residence or lengthened stay, the climates of the different counties are so different themselves that the wisest plan is to give a fair trial to several of the neighbourhoods. Probably San Diego County would be found to be the most satisfactory for an all-the-year-round home. The climate and beautiful position of Coronado Island attract visitors from all parts of the world. The hotel looks right down on the splendid rollers of the Pacific, and the air from that pure summer sea is particularly soft and caressing. Los Angeles has all the advantages of being a go-ahead, ambitious town within reach of

delightful scenery. Riverside is a town of old established ranches, with plenty of social life and out-door sport. Pasadena is a charming suburb of Los Angeles, spreading along the San Gabriel valley and having the stately Sierra Madre range for its protecting deity. Santa Barbara, very similar in situation to Mentone, is especially attractive, greener than most places in Southern California, a very fairy-land of flowers, and with foot-hills which in spring-time are covered with a scented mantle of the yellow wild mustard. And certainly one must not forget the Ojai valley, and the still more beautiful Santa Paula valley, which is apt to remind one of bits of England and Wales.

So one can take one's choice and move on until the right requirements are found. Visitors and invalids with ample means do not need any words of warning; it is easy enough for them to

change their plans. But people who are coming from older countries to settle in Southern California cannot be too strongly urged to pause for a time before pitching their tents anywhere. The conditions of life in the West are so utterly different from those found in the Old World that it is quite impossible to realise what one is giving up, and whether one is likely to get a sufficient compensation in climate, circumstance, and chances of success. These remarks do not apply to the so-called labouring classes of Europe or the Eastern States of America: they lose nothing and gain everything by coming out to a new country. Southern California is a paradise for them and means good living, good wages, and good opportunities of rising as high as they choose. But for the gently nurtured and for those who have been within reach of artistic and intellectual satisfaction it is

altogether a different matter. These wants will make themselves felt, however gallantly one may contend with them, and there is a starvation of the soul just as possible as the starvation of the body. These are the people who will probably suffer from that sad illness, homesickness, and it is for them that these words are especially written. From all that one can gather about the subject, it would seem to be a mistake for middle-aged folk to uproot themselves from their old surroundings and venture into these new pastures. It goes much better if one comes when one is young enough to leave no regrets behind, and bringing only the brightest and freshest of hopes untarnished by old memories.

There is no doubt whatsoever that it is a mistake, if not a cruelty, to bring delicate women out to ranch life, unless there are ample means to pay the very

large sum asked and given for household help. It is absurd to talk of the advantages of any climate from Dan to Beersheba itself, if a woman is to be weighed down by hard physical work, such as house-cleaning and washing and baking, for which she has not been trained, and which hitherto has probably never come into her horizon. As a woman herself, the writer of these few pages may be pardoned for laying particular stress on the dangers and sufferings liable to arise through ignorance of these important facts.

It is pleasant to turn away from sombre thoughts, and in conclusion to speak of some of the more familiar animals and birds and insects found in Southern California. The humming-bird is one of our most welcome friends in the country. A quarrelsome little fellow with his own kind, and very masterful, he is nevertheless easily tamed. Meadow-larks abound

everywhere, cheerfully singing, according to reliable authority, the words "Drink out of a bottle, bottle!" We shall find blue-jays, orioles, finches and butcher-birds, canaries, ground-owls, yellow-hammers, mocking-birds, robins, doves, thrushes and woodpeckers, and many kinds of sparrows, and a few wrens. The most characteristic bird of California is the chaparral cock, or paisano, or road-runner, which can be made into a great pet, and is seldom shot at. The turkey-buzzard, majestic in its flight, is a well-known feature of the landscape. Quail are plentiful both in the valleys and on the hills, and are delicious food if properly cooked. Ants of many varieties hold possession of the land, and may be seen busy at work all the day long, out of the house and inside too, unless one keeps a ruthless lookout. The tarantula spider is an enormous creature, and is said to give as poisonous

a bite as the rattlesnake. Centipedes and scorpions are found, and of course lizards. The pretty little horned toads are quite harmless. The snakes are for the most part harmless, except the rattlesnakes, of which there are two kinds, —a dark grey and black and a red. They are not aggressive, and desire only to be left alone. When once the ground has been cleared they disappear, creeping up to the hot rocky barren hill-tops, their favorite dwelling places. But one cannot be too cautious how one treads, when one has left the main road; for their colour harmonises both with the sage-brush and the dry earth, and it is quite easy to step on them unawares. Still they are very easily killed; in fact, the barefooted children running to school kill them with a well-aimed stone or a long stick or whip and think nothing of the matter. Bounding all over the country may be seen the jack-rabbit

and the cotton-tail; and, alas! there is no mistaking the passage of the skunk. Coyotes disturb the peace of the night, and eat as many chickens as they can capture. Wild-cats are found in some of the cañons, and now and again a mountain lion descends from its solitary heights and prowls round the barns. Deer are found in the mountains, and they are said to be very good eating. Speaking of food reminds one of the fish of the Pacific. They are abundant, certainly, and inspire one with the enthusiasm of Izaak Walton, but they are not specially dainty or delicate. The barracuda is the best; Spanish mackerel is passable, and the yellow-tail is rather like a solid beefsteak of coarse fibre. The best one can say of them is that they are not worthy to come out of such a beautiful ocean. For time after time one's thoughts return gratefully to the memory of the Pacific: its blueness, its fresh-

ness, and all its indescribable charm. It may well stand for one's ideal of perfection in nature.

# CHAPTER II.

## THE CLIMATOLOGY OF SOUTHERN CALIFORNIA.

A GREAT deal that is misleading has been written about the climate of Southern California. Its charms have been exaggerated, and its drawbacks either passed over in silence or painted in glowing and attractive colours.

The simple truth about California of the south is quite good enough.

It is a fact that here is to be found the best yearly climate in the world. Other localities have as good or perhaps a better climate than ours at their best, but certainly none of them have this happy condition the year round as we do, on the coast and at the higher altitudes.

A striking peculiarity, and one leading to much confusion, is the great diversity

of climate of this country, and the different climatic conditions found in even one day's journey. This infinite variety embraces the perpetual coolness of the coast, the hot dryness of the far inland, or desert, the almost perpetual snows of the higher mountains, and the conditions (similar to the mountain regions of New England) found at a lower elevation,—that of four thousand five hundred or five thousand feet. At the lower stations the various climates all have the peculiar charm of California's equability.

Within a few hours from any given point one may obtain the climate to his liking. This is invaluable to the invalid or health-seeker wishing an immediate change of air. It enables the residents of the interior valleys too to find a lower and more agreeable temperature in summer by visiting the sea-shore or by ascending some of the surrounding mountains.

New-comers, however, are often bewildered by all this variety, and make statements to far-away friends that add chaos to confusion in the minds of Eastern people. This is only natural in a land where the mail-carrier, in his shirt-sleeves, leaves the semi-tropical valley of El Cajon, almost at sea-level, and in a few hours arrives, wrapped in two overcoats, at Julian, five thousand feet above the sea. One traveller reports California to be all sunshine and flowers, another all fog and cold. Some complain of the dry desert winds, with their exciting electrical conditions, while others dwell upon the excessive humidity; when the probable truth is that the critic has not selected the proper environment, and has passed by what he is seeking, which is, no doubt, within a few short miles.

A correct understanding of a climate so varied and with so many possibilities

for life and health cannot be obtained at once. Quite a year's residence is required to know all its advantages and disadvantages.

We do have cold days. We also have those that are altogether too warm for pleasure and comfort. But we almost never have sufficient cold to injure or kill the most delicate vegetation, nor, on the other hand, is the heat ever prostrating or dangerous to the individual or his animals.

We shall see later that this country affords one the greatest latitude in the selection of a home; it may be placed upon the sea-coast in the dryest known marine climate, or, somewhat removed from the coast, in the valleys, which are dryer and warmer; or, again, far in the interior, on the desert of the Mojave or the Colorado, where the temperature is excessively high and the atmosphere almost destitute of moisture.

There is little seasonal change in the extreme southern part of the State. I am accustomed to say to inquirers that our winters resemble September and October in the middle Atlantic coast States, and that our summers are like April and May in the same region. It will be seen, then, that the dividing-line between summer and winter is more imaginary than real; it exists in the calendar and the change of vegetation more than in the temperature. Some writer has said that one should stay here the year through and select from any of the months the days that suit his idea of winter; from the fact that the greatest humidity is in the summer and the least in the winter, he may wear an overcoat in July in a temperature which, according to the thermometer, would render it unnecessary in January. For example, the afternoon temperature at San Diego in December, January, February, and

March was respectively 60.5°, 60.9°, 57.7°, 62.4° F., and in July it was 63.4° F.; the maximum temperature for July was 79° and for January 74° F.

The greatest change in temperature occurs at night, more marked in the interior valleys than on the coast, and is shown by the fact that in January Los Angeles, which is inland, shows a register of 46.5° F., and San Diego, which is littoral, 47.5° at 7 P.M., while at 3 P.M. the figures stand respectively, Los Angeles 65.2° and San Diego 60.9° F. In summer this difference is more marked. Warner has observed the thermometer reach 103° at an inland station, while on the coast it was but 79° F. This thermometric registration has a peculiarity which one must always bear in mind: while a temperature of 85° or 90° F. in New York is almost unendurable, it is far from oppressive in Southern California. Many of us

consider the summer of littoral California as the pleasantest season of the year.

A glance at the thermometric tables will show that in some years the months of July, August, September, and October show a three o'clock temperature with hardly an appreciable difference. The greatest change is at midnight and just before sunrise, hours at which most people, particularly health-seekers, are not exposed to alternations in temperature.

I wish to call particular attention to the apparent difference between sunshine and shade, and mid-day and midnight. This change is more a subjective sensation than a reality, and is true of all semi-tropical locations. It is less marked in California than in Italy, but it always appeals strongly to the newcomer, who is surprised at the immediate sense of chill when he enters the shade from the direct rays of the sun. It is on

this account that one who learns to know this climate is rarely seen without a light over-covering within reach; there are some, however, who will become so acclimated that this additional covering will become superfluous, but these constitute the small minority.

As night advances the temperature decreases, and while this change may not cause the mercury to fall many degrees, still it is very noticeable to the individual. This is less marked on the coast in summer, and more so at all seasons in the interior.

Further to show the remarkable equability of the coast climate, as illustrated by San Diego, we present the following table through the courtesy of M. Yale Beach, Esq. It shows the maximum and minimum temperature at San Diego for twenty-two years, and is compiled from the official record of the United States Weather Bureau.

| Year. | Jan. | | Feb. | | Mar. | | April. | | May. | | June. | | July. | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. | Mx. | Mn. |
| 1872 | 73 | 37 | 68 | 44 | 71 | 44 | 74 | 43 | 83 | 52 | 80 | 55 | 75 | 58 | 86 | 60 | 80 | 54 | 87 | 45 | 81 | 42 | 72 | 40 |
| 1873 | 75 | 44 | 77 | 37 | 72 | 40 | 82 | 42 | 78 | 52 | 75 | 58 | 77 | 60 | 78 | 63 | 82 | 55 | 76 | 49 | 85 | 49 | 68 | 44 |
| 1874 | 71 | 42 | 64 | 41 | 63 | 41 | 71 | 43 | 74 | 50 | 76 | 52 | 79 | 59 | 83 | 56 | 78 | 54 | 90 | 46 | 75 | 45 | 82 | 39 |
| 1875 | 68 | 42 | 70 | 44 | 71 | 39 | 77 | 39 | 82 | 50 | 77 | 53 | 79 | 61 | 83 | 63 | 88 | 57 | 88 | 53 | 78 | 50 | 75 | 38 |
| 1876 | 65 | 39 | 77 | 39 | 75 | 43 | 87 | 43 | 76 | 50 | 88 | 51 | 78 | 60 | 81 | 60 | 82 | 54 | 80 | 48 | 79 | 43 | 77 | 43 |
| 1877 | 78 | 42 | 75 | 45 | 70 | 48 | 67 | 44 | 68 | 51 | 94 | 55 | 86 | 59 | 82 | 58 | 91 | 58 | 73 | 47 | 78 | 46 | 78 | 40 |
| 1878 | 68 | 38 | 69 | 44 | 68 | 42 | 77 | 44 | 73 | 48 | 76 | 51 | 77 | 56 | 80 | 55 | 100 | 53 | 87 | 44 | 77 | 40 | 79 | 35 |
| 1879 | 76 | 35 | 74 | 38 | 99 | 44 | 82 | 45 | 94 | 47 | 93 | 52 | 75 | 58 | 81 | 54 | 92 | 54 | 92 | 46 | 79 | 43 | 71 | 32 |
| 1880 | 73 | 32 | 63 | 35 | 69 | 38 | 80 | 42 | 84 | 46 | 73 | 52 | 73 | 54 | 84 | 56 | 82 | 50 | 81 | 48 | 78 | 40 | 77 | 40 |
| 1881 | 70 | 36 | 82 | 39 | 72 | 40 | 82 | 51 | 72 | 51 | 76 | 53 | 80 | 57 | 82 | 56 | 86 | 52 | 72 | 46 | 76 | 38 | 77 | 39 |
| 1882 | 64 | 34 | 70 | 37 | 79 | 39 | 70 | 43 | 73 | 48 | 75 | 55 | 78 | 57 | 83 | 62 | 80 | 58 | 81 | 49 | 80 | 42 | 78 | 41 |
| 1883 | 76 | 32 | 83 | 36 | 71 | 48 | 85 | 42 | 89 | 45 | 84 | 56 | 80 | 59 | 84 | 60 | 101 | 59 | 80 | 48 | 82 | 43 | 78 | 42 |
| 1884 | 78 | 39 | 79 | 38 | 68 | 43 | 69 | 45 | 72 | 47 | 81 | 50 | 84 | 54 | 92 | 54 | 78 | 51 | 87 | 47 | 74 | 42 | 68 | 36 |
| 1885 | 68 | 38 | 76 | 40 | 81 | 42 | 83 | 47 | 73 | 52 | 74 | 52 | 82 | 58 | 89 | 62 | 90 | 56 | 88 | 47 | 76 | 42 | 79 | 40 |
| 1886 | 74 | 35 | 80 | 44 | 68 | 41 | 71 | 45 | 72 | 50 | 75 | 54 | 81 | 57 | 82 | 61 | 78 | 60 | 75 | 47 | 77 | 40 | 76 | 40 |
| 1887 | 74 | 38 | 76 | 38 | 82 | 44 | 80 | 44 | 79 | 48 | 78 | 54 | 79 | 60 | 77 | 54 | 79 | 58 | 85 | 50 | 82 | 44 | 74 | 36 |
| 1888 | 64 | 33 | 67 | 42 | 72 | 41 | 93 | 47 | 70 | 52 | 76 | 54 | 77 | 55 | 82 | 57 | 82 | 58 | 80 | 53 | 75 | 46 | 73 | 44 |
| 1889 | 78 | 36 | 85 | 37 | 80 | 45 | 83 | 47 | 80 | 50 | 72 | 56 | 84 | 59 | 89 | 62 | 91 | 54 | 80 | 52 | 83 | 46 | 69 | 40 |
| 1890 | 66 | 35 | 77 | 38 | 74 | 41 | 85 | 45 | 75 | 46 | 93 | 51 | 80 | 56 | 89 | 58 | 83 | 60 | 90 | 49 | 91 | 46 | 79 | 47 |
| 1891 | 76 | 35 | 70 | 34 | 76 | 41 | 77 | 44 | 67 | 53 | 78 | 53 | 88 | 58 | 85 | 60 | 89 | 55 | 84 | 50 | 82 | 44 | 72 | 32 |
| 1892 | 75 | 38 | 68 | 42 | 73 | 44 | 80 | 41 | 87 | 47 | 75 | 51 | 75 | 57 | 80 | 57 | 80 | 54 | 83 | 46 | 84 | 40 | 71 | 36 |
| 1893 | 80 | 38 | 75 | 40 | 75 | 40 | 78 | 43 | 88 | 49 | 75 | 53 | 79 | 47 | 81 | 59 | 77 | 53 | 88 | 50 | 83 | 40 | 82 | 38 |
| 1894 | 69 | 32 | 69 | 34 | 72 | 36 | 83 | 43 | 72 | 45 | 73 | 50 | 77 | 57 | 90 | 55 | 90 | 52 | 87 | 45 | 78 | 45 | 70 | 41 |

It requires a temperature of 28° F. to kill oranges or lemons. From 1875 to 1891—6205 days—there were 6006 days of temperature not above 80° nor below 40° F.

| | Midnight. | 1 A.M. | 2 A.M. | 3 A.M. | 4 A.M. | 5 A.M. | 6 A.M. | 7 A.M. | 8 A.M. | 9 A.M. | 10 A.M. | 11 A.M. | Noon. | 1 P.M. | 2 P.M. | 3 P.M. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1895. | | | | | | | | | | | | | | | | |
| January | 50 | 48 | 49 | 49 | 49 | 48 | 48 | 48 | 47 | 52 | 55 | 57 | 59 | 58 | 58 | 59 |
| February | 52 | 52 | 51 | 51 | 51 | 50 | 50 | 50 | 53 | 56 | 57 | 59 | 61 | 61 | 62 | 62 |
| March | 51 | 51 | 51 | 51 | 51 | 50 | 50 | 51 | 53 | 55 | 57 | 58 | 59 | 60 | 60 | 59 |
| April | 54 | 53 | 53 | 52 | 52 | 52 | 52 | 54 | 56 | 58 | 60 | 62 | 63 | 63 | 63 | 63 |
| May | 59 | 59 | 59 | 59 | 58 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 65 | 65 | 64 |
| June | 60 | 59 | 59 | 59 | 59 | 59 | 60 | 60 | 62 | 64 | 65 | 66 | 66 | 66 | 66 | 66 |
| July | 63 | 63 | 63 | 62 | 62 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 69 | 69 | 69 |
| 1894. | | | | | | | | | | | | | | | | |
| August . | 64 | 64 | 64 | 64 | 63 | 64 | 64 | 65 | 67 | 68 | 69 | 69 | 70 | 70 | 70 | 69 |
| September | 63 | 62 | 62 | 62 | 62 | 62 | 62 | 63 | 65 | 67 | 69 | 70 | 72 | 72 | 72 | 72 |
| October | 59 | 58 | 58 | 58 | 58 | 58 | 57 | 59 | 60 | 64 | 66 | 67 | 67 | 68 | 68 | 68 |
| November | 54 | 53 | 52 | 52 | 52 | 52 | 51 | 52 | 54 | 56 | 58 | 60 | 62 | 62 | 62 | 62 |
| December | 54 | 53 | 52 | 52 | 52 | 52 | 51 | 52 | 55 | 58 | 61 | 63 | 63 | 63 | 63 | 63 |
| Mean temperature | 57 | 56 | 56 | 56 | 56 | 55 | 56 | 56 | 59 | 60 | 62 | 63 | 64 | 64 | 65 | 65 |

**Greatest variation in any one day, 31° F., on February 27; least on January 14, variation being only 2° F. in the twenty-four hours. Greatest variation during entire year, 53° F. Lowest temperature, 37° F. for one hour only, on January 27, at 1 P.M.; highest, 90° F., for one hour only, September 15, at 4 P.M. Mean annual temperature, 60° F. Mean annual humidity, 78 per cent. Compiled by John Ginty.**

| | 4 P.M. | 5 P.M. | 6 P.M. | 7 P.M. | 8 P.M. | 9 P.M. | 10 P.M. | 11 P.M. | Mean monthly temperature. | Maximum temperature. | Minimum temperature. | Greatest variation in any one day. | Least variation in any one day. | Mean monthly humidity. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1893. | | | | | | | | | | | | | | |
| January | 58 | 58 | 56 | 54 | 53 | 53 | 51 | 51 | 53 | 77 | 36 | 22 | 4 | 76 |
| February | 61 | 60 | 58 | 56 | 55 | 54 | 53 | 52 | 55 | 78 | 38 | 31 | 4 | 74 |
| March | 59 | 61 | 60 | 55 | 55 | 54 | 53 | 52 | 54 | 74 | 38 | 30 | 4 | 80 |
| April | 62 | 63 | 63 | 58 | 57 | 56 | 54 | 54 | 57 | 80 | 44 | 36 | 4 | 79 |
| May | 64 | 65 | 64 | 63 | 62 | 61 | 60 | 59 | 58 | 77 | 51 | 39 | 3 | 78 |
| June | 66 | 65 | 65 | 63 | 64 | 64 | 61 | 60 | 63 | 77 | 51 | 29 | 4 | 78 |
| July | 68 | 68 | 66 | 65 | 64 | 64 | 63 | 63 | 63 | 74 | 57 | 28 | 4 | 77 |
| 1894. | | | | | | | | | | | | | | |
| August | 69 | 68 | 66 | 65 | 65 | 65 | 64 | 64 | 66 | 90 | 55 | 30 | 3 | 82 |
| September | 69 | 68 | 66 | 65 | 65 | 65 | 64 | 63 | 66 | 90 | 58 | 35 | 3 | 80 |
| October | 68 | 68 | 63 | 62 | 61 | 61 | 60 | 60 | 68 | 87 | 45 | 26 | 4 | 76 |
| November | 60 | 64 | 57 | 56 | 55 | 55 | 55 | 54 | 56 | 78 | 45 | 30 | 5 | 88 |
| December | 61 | 60 | 57 | 56 | 55 | 55 | 54 | 54 | 57 | 70 | 41 | 26 | 3 | 78 |
| Mean temperature | 63 | 62 | 61 | 59 | 59 | 58 | 58 | 57 | ... | ... | ... | ... | ... | ... |

The preceding table presents the average temperature for each hour of the day of each month of the year, and the greatest and least variation of temperature in any twenty-four hours. In addition, it presents the mean monthly humidity. It was compiled from the statistics of the United States Weather Bureau by John Ginty, Esq.

Temperature records are very misleading, from the fact that two localities may have the same mean temperature, either annual or monthly, and yet be vastly different in their thermal conditions. This is well illustrated by W. F. R. Phillips, M.D.,* who presents the following example: Des Moines, Iowa, and Tatoosh Island, Washington, have the same annual mean temperature, 49° F., but the mean temperature of the hottest month in the former place is 75° F., and

* Report of the Chief of the Weather Bureau, 1891–92, pp. 29–30.

that in the latter 56° F. The mean temperature of the coldest month of Des Moines is 18° F., and of Tatoosh Island 41° F. Again, the highest temperature recorded at Des Moines is 104° F., and at Tatoosh Island 78° F., and the lowest temperature at the first 30° F. below zero, and at the latter 7° F. above. This makes a total range of 134° F. for the one and 85° F. for the other.

It will thus be seen that, in order to obtain a correct appreciation of the thermal conditions of a given place, though it may be on the same isotherm as one with which we are very familiar, it is necessary to consider their various phases of atmospheric temperature.* To ac-

* Phillips (*ibid.*) considers the more important of these phases to be,—

1. The mean daily temperature or the average degree of heat received in twenty-four hours which, meteorologically defined, is the arithmetical mean of twenty-four-hourly observation. In practice this is

complish this we present a record of the self-registering thermograph at the

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obtained by using the mean of the highest and lowest temperatures recorded by self-registering thermometers.

2. The daily mean maximum temperature, or the average of a series of the daily highest temperatures recorded at any moment and during a given period.

3. The daily mean minimum temperature, or the average of a series of the daily lowest temperatures recorded.

4. The average daily range of temperature, or the difference between the mean maximum and mean minimum temperatures.

5. The daily mean variability of the temperature, or the average difference between the mean temperatures of any two consecutive days.

6. The absolute maximum temperature, or greatest degree of heat received at any moment during a given period.

7. The absolute minimum temperature, or the lowest degree of heat at any moment during a given period.

The first five phases show the temperature probabilities and the last two the temperature possibilities

United States Weather Bureau, San Diego, California, showing the number of hours that each degree of temperature registered last year, compiled by John Ginty, Esq.

The so-called rainy season in this section usually begins in November, though slight showers may have occurred in October, and it lasts until about the middle of April. One must remember, however, that this rain period is not one of continuous downpour, but is pleasantly interspersed with bright, warm days and dazzling sunshine, and also that the heaviest rain is very apt to fall at night. Here again we find it difficult to make a hard and fast statement. The seasons, even in this land of equable climatic con-

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of a climate. All these points are well shown in the tables which appear in the text. A careful study of these tables will furnish one with all the variations of temperature for the southern coast-strip of California.

| Temperature. | 37 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. |
| 1893. | | | | | | | | | | | | | | | | | | | | | |
| January | 1 | 1 | 5 | 5 | 11 | 6 | 23 | 28 | 34 | 35 | 99 | 34 | 51 | 35 | 49 | 53 | 71 | 74 | 40 | 39 | 55 |
| February | . . | . . | . . | 2 | . . | 1 | 2 | 10 | 22 | 17 | 30 | 34 | 29 | 29 | 52 | 57 | 68 | 68 | 37 | 36 | 29 |
| March | . . | . . | 1 | 1 | 3 | 3 | 5 | 12 | 18 | 25 | 28 | 29 | 47 | 42 | 45 | 60 | 69 | 65 | 67 | 41 | 38 |
| April | . . | . . | . . | . . | . . | . . | . . | 1 | . . | 6 | 16 | 19 | 27 | 23 | 36 | 40 | 63 | 51 | 77 | 55 | 47 |
| May | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | 3 | . . | 5 | 13 | 55 | 29 | 63 |
| June | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | 2 | 4 | 4 | 13 | 13 | 12 | 38 |
| July | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | 6 |
| 1894. | | | | | | | | | | | | | | | | | | | | | 3 |
| August | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | 8 |
| September | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | 1 | . . | . . | 1 | 2 | 5 | 4 | 13 | 13 |
| October | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | 1 | 2 | 1 | 3 | . . | 8 | 12 | 48 | 27 | 74 |
| November | . . | . . | . . | . . | . . | . . | . . | . . | 1 | 10 | 13 | 24 | 21 | 38 | 51 | 58 | 65 | 71 | 77 | 46 | 64 |
| December | . . | . . | 2 | 1 | . . | 3 | 8 | 4 | 10 | 15 | 16 | 34 | 36 | 35 | 50 | 43 | 48 | 73 | 60 | 58 | 38 |
| Total hours | 1 | 1 | 8 | 9 | 14 | 13 | 38 | 55 | 85 | 109 | 132 | 175 | 214 | 209 | 291 | 318 | 404 | 439 | 440 | 356 | 465 |

| Temperature. | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. | Hours. |
| 1893. | | | | | | | | | | | | | | | | | | | | | |
| January | 10 | 7 | 6 | 9 | 5 | 4 | 6 | 3 | 1 | 3 | 1 | 2 | 4 | | 1 | 3 | | | | | |
| February | 20 | 21 | 20 | 11 | 15 | 8 | 7 | 4 | 7 | 4 | 8 | 3 | 3 | | 1 | 1 | 3 | 4 | | | |
| March | 45 | 39 | 15 | 11 | 7 | 13 | 4 | 6 | 1 | | 1 | 1 | 2 | | | | 1 | | | | |
| April | 48 | 89 | 41 | 33 | 25 | 26 | 12 | 11 | 16 | 5 | 2 | 1 | | | | | | 1 | | 1 | |
| May | 114 | 116 | 105 | 53 | 55 | 50 | 40 | 27 | 13 | 8 | 5 | 4 | 4 | | 2 | 4 | 1 | 2 | 1 | 1 | 1 |
| June | 54 | 86 | 79 | 72 | 81 | 59 | 57 | 40 | 47 | 22 | 13 | 7 | 4 | | 1 | 2 | 4 | | | | |
| July | 9 | 26 | 41 | 72 | 122 | 108 | 57 | 45 | 60 | 81 | 49 | 31 | 27 | | | | | | | | |
| 1894. | | | | | | | | | | | | | | | | | | | | | |
| August | 7 | 22 | 55 | 60 | 86 | 50 | 55 | 83 | 78 | 68 | 46 | 42 | 36 | 16 | 6 | 6 | 2 | 4 | 6 | 5 | 5 |
| September | 14 | 28 | 36 | 54 | 82 | 88 | 63 | 63 | 46 | 45 | 35 | 30 | 30 | 20 | 6 | 3 | 2 | 6 | 1 | 1 | 1 |
| October | 84 | 86 | 55 | 66 | 47 | 51 | 40 | 30 | 20 | 18 | 7 | 7 | 7 | 6 | 4 | 6 | 6 | 4 | 4 | 4 | 2 |
| November | 35 | 40 | 29 | 44 | 17 | 8 | 2 | 2 | 2 | 1 | | | 3 | 1 | 1 | 1 | | 1 | | | |
| December | 30 | 89 | 18 | 14 | 15 | 10 | 8 | 2 | 6 | 10 | 11 | 8 | 5 | 16 | 3 | 10 | 4 | 3 | 2 | | 5 |
| Total hours | 470 | 589 | 500 | 494 | 557 | 475 | 351 | 316 | 297 | 265 | 176 | 156 | 125 | 86 | 28 | 36 | 23 | 25 | 15 | 12 | 14 |

| Temperature. | | Hours. | Total hours. | Mean temperature. |
|---|---|---|---|---|
| | 1895. | | | |
| | January | | 744 | 53 |
| | February | | 672 | 55 |
| | March | | 744 | 54 |
| | April | | 720 | 57 |
| | May | | 744 | 58 |
| | June | | 720 | 63 |
| | July | | 744 | 65 |
| | 1894. | | | |
| | August | | 744 | 66 |
| | September | | 720 | 68 |
| | October | | 744 | 68 |
| | November | | 720 | 56 |
| | December | | 744 | 57 |
| | Total hours | | 8760 | 60 |
| 80 | | 10 | | |
| 81 | | 5 | | |
| 82 | | 3 | | |
| 83 | | 1 | | |
| 84 | | 3 | | |
| 85 | | 4 | | |
| 86 | | 3 | | |
| 89 | | 2 | | |
| 98 | | 1 | | |

Greatest variation in any one day, 31° F., on February 27; least on January 14, variation being only 2° F. in the twenty-four hours. Greatest variation during the entire year, 53° F. Lowest temperature, 37° F., for one hour only, on January 27, at 1 P.M.; highest, 90° F., for one hour only, September 15, at 4 P.M. Mean annual temperature, 60° F. Mean annual humidity, 78 per cent. From 1872 to 1896, out of 7401 days there were only a few hours in 247 days that the temperature exceeded 80° F., and only 2 days in which it fell as low as 32° F. above zero. [Copyright 1895, by John Ginty.]

ditions, are liable to vary greatly in the total rainfall and its distribution. In some years it exceeds the quantity which has been established as the maximum, and in others is far below the average minimum.

The following table shows the rainfall for twenty-four years, recorded by self-recording instruments in the United States Weather Bureau.

During the winter months there are few days on which one cannot be out of doors at least a portion of the twenty-four hours. The rains occur when the winds are from the south, and discontinue as soon as the prevailing western winds arise, when the atmosphere at once clears. Thus there is an entire absence of the enervating steamy heat of the Atlantic coast, and one can immediately resume his out-door life. It is a well-known fact that a thermometrical heat which would be enervating in other

*Table showing Rainfall for Twenty-four Years.*

| Years. | 1872 | 1873 | 1874 | 1875 | 1876 | 1877 | 1878 | 1879 | 1880 | 1881 | 1882 | 1883 | 1884 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Months. | | | | | | | | | | | | | |
| January . . . | .99 | .44 | 3.11 | 2.38 | 2.47 | 1.05 | 1.45 | 3.54 | .61 | .52 | 4.53 | 1.09 | 1.34 |
| February . . | 2.63 | 4.15 | 3.73 | .37 | 2.44 | .18 | 4.83 | 1.04 | 1.50 | .45 | 2.55 | .95 | 9.05 |
| March . . . . | .46 | .11 | 1.20 | .45 | 1.78 | 1.44 | 1.41 | .10 | 1.43 | 1.88 | 1.02 | .41 | 6.23 |
| April . . . . | .26 | .10 | .34 | .12 | .06 | .26 | 2.91 | .60 | 1.34 | 1.35 | .45 | .31 | 2.84 |
| May . . . . | .12 | .03 | .34 | .20 | .05 | .43 | .58 | 0 | .06 | .04 | .18 | 1.14 | 2.17 |
| June . . . . | 0 | 0 | 0 | .02 | .05 | 0 | .16 | .07 | .06 | .05 | .07 | .08 | .31 |
| July . . . . . | 0 | 0 | .12 | 0 | .03 | 0 | 0 | 0 | .09 | 0 | 0 | 0 | 0 |
| August . . . | .18 | 1.95 | 0 | .21 | .06 | 0 | 0 | 0 | .32 | .01 | 0 | 0 | 0 |
| September . . | 0 | 0 | .11 | .39 | .03 | 0 | 0 | 0 | 0 | .04 | .01 | 0 | .07 |
| October . . . | 0 | 0 | .53 | 0 | .08 | .81 | .96 | .29 | .53 | .24 | .41 | 2.01 | .35 |
| November . . | 0 | .77 | .88 | 2.25 | .04 | .06 | 0 | 2.77 | .28 | .12 | .39 | .20 | .11 |
| December . . | 1.40 | 5.46 | .55 | .44 | .15 | 3.89 | 1.57 | 6.30 | 4.15 | .30 | .13 | 1.82 | 5.12 |
| Annual rainfall . . . . | 6.04 | 13.01 | 10.91 | 6.80 | 7.24 | 8.12 | 13.87 | 14.71 | 10.37 | 5.00 | 9.74 | 8.01 | 27.59 |

*Table showing Rainfall for Twenty-four Years—Continued.*

| Years. | 1885 | 1886 | 1887 | 1888 | 1889 | 1890 | 1891 | 1892 | 1893 | 1894 | 1895 | Monthly average. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Months. | | | | | | | | | | | | |
| January . . . | .35 | 6.95 | .04 | 1.05 | 1.72 | 2.79 | 1.21 | 1.58 | .78 | .29 | 7.33 | 1.94 |
| February . . | .02 | 1.51 | 4.51 | .75 | 1.80 | 1.70 | 4.84 | 2.96 | .78 | .49 | .53 | 2.24 |
| March . . . | .78 | 3.73 | .02 | 1.24 | 2.20 | .41 | .27 | .96 | 5.50 | 1.05 | 1.43 | 2.48 |
| April . . . . | 1.20 | 1.95 | 2.14 | .08 | .19 | .05 | .76 | .41 | .22 | .11 | .11 | .76 |
| May . . . . | .61 | .04 | .47 | .15 | .03 | .08 | .35 | 1.15 | .39 | .09 | .19 | .34 |
| June . . . . | .06 | .07 | .04 | .04 | .10 | 0 | .05 | .13 | 0 | .01 | 0 | .06 |
| July . . . . . | 0 | 0 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| August . . . | .13 | 0 | 0 | 0 | .04 | 0 | 0 | .05 | 0 | .04 | 0 | .13 |
| September . . | 0 | 0 | 0 | .04 | 0 | .65 | .08 | 0 | 0 | .01 | .01 | .06 |
| October . . . | .31 | .05 | 0 | .20 | 2.12 | .01 | .04 | .22 | .11 | 0 | .27 | .40 |
| November . . | 1.56 | .95 | 2.08 | 1.83 | .12 | .72 | .10 | .94 | .91 | 0 | 1.19 | .76 |
| December . . | .71 | .10 | 1.14 | 1.04 | 7.71 | 1.61 | 1.29 | .69 | 1.91 | 2.26 | .87 | 2.09 |
| Annual rainfall . . . . | 5.73 | 15.35 | 10.45 | 5.29 | 16.03 | 8.02 | 8.99 | 9.09 | 10.60 | 4.35 | 11.33 | 10.23 |

localities is stimulating in Southern California.

The coast fog, about which so much has been written, is most frequent during the months of April, May, and June. The fog-bank usually rolls in about nightfall, and disappears a few hours before sunrise. About nine o'clock in the morning the coast is entirely free from fog. During these months there are a few days, however, when the fog is more persistent, and a fine mist lasts until half-past twelve or one o'clock; but this happens only a half-dozen days out of the year.

The sunshine record is accurately recorded by the United States government. The following table was obtained from their annual report for the year 1893, the latest published, and is of great interest and value in our present study. It shows the main climatic conditions for the greater portion of California, as well

as the principal sections of the United States. The table is full of interesting deductions, which can be made by the reader. Placing the sunshine for twenty-four hours at one hundred, the figures in the table will give the part of one hundred in which the sunshine has been actually observed, the result being expressed as a percentage of sunshine. The ingenious instruments used to make this record are the photographic and thermometric sunshine recorders, described by Professor Marvin.* The best results are obtained from the western stations, where the proportion of sunshine is greater and the atmosphere dryer.

This report shows that at San Diego there was sixty-eight per cent. of the possible sunshine during 1893; that

* Report of the Chief of the Weather Bureau for 1891–92.

August had seventy-six per cent. of possible sunshine; April and October, seventy-five per cent.; July, seventy-three

| Place. | Sunshine, per cent. | No. days clear or partly cloudy. | No. days cloudy. | Total precipitation. | Temperature. | |
|---|---|---|---|---|---|---|
| | | | | | Mean maximum. | Mean minimum. |
| San Francisco | 60 | 235 | 80 | 17.91 | 60.1 | 48.5 |
| Red Bluff | *65 | 305 | 60 | 24.36 | 71.7 | 49.5 |
| Sacramento | *60 | 286 | 79 | 16.59 | 69.6 | 48.1 |
| Fresno | *66 | 304 | 61 | 9.40 | 74.2 | 47.9 |
| San Diego | 68 | 316 | 49 | 10.29 | 63.2 | 53.0 |
| Los Angeles | *65 | 321 | 44 | 21.96 | 72.8 | 50.2 |
| Eureka | *40 | 214 | 151 | 53.71 | 56.0 | 45.2 |
| Boston | 53 | 240 | 125 | 41.84 | 55.3 | 40.5 |
| Buffalo | 47 | 239 | 126 | 38.64 | 52.8 | 38.8 |
| Chicago | *47 | 254 | 111 | 27.47 | 52.9 | 39.2 |
| Cincinnati | 47 | 253 | 112 | 44.00 | 62.1 | 45.3 |
| Cleveland | 42 | 222 | 143 | 33.88 | 55.4 | 40.7 |
| Denver | 67 | 326 | 39 | 8.48 | 69.3 | 37.9 |
| Detroit | 48 | 234 | 131 | 34.18 | 54.5 | 39.2 |
| Dodge City | 74 | 326 | 39 | 10.12 | 68.3 | 41.0 |
| Eastport, Me | 45 | 228 | 137 | 29.87 | 47.8 | 34.2 |
| Galveston | 59 | 288 | 77 | 35.43 | 75.1 | 65.4 |
| Kansas City | 57 | 282 | 83 | 32.12 | 62.5 | 43.2 |
| Memphis | 60 | 282 | 83 | 44.45 | 70.6 | 52.0 |
| New Orleans | 52 | 289 | 76 | 48.02 | 76.8 | 61.9 |
| New York City | *47 | 255 | 110 | 53.01 | 58.4 | 44.2 |
| Philadelphia | 49 | 229 | 136 | 37.65 | 60.7 | 45.2 |
| Portland, Ore | 37 | 185 | 180 | 39.03 | 57.1 | 43.1 |
| St. Louis | 60 | 274 | 91 | 39.33 | 63.8 | 46.7 |
| Salt Lake City | 63 | 274 | 91 | 17.35 | 59.9 | 40.4 |
| Santa Fé | 74 | 334 | 31 | 14.94 | 60.1 | 38.7 |
| Savannah | 53 | 285 | 80 | 61.58 | 75.5 | 57.9 |
| Tucson | 77 | 316 | 49 | 13.12 | 81.9 | 50.4 |
| Washington City | 52 | 262 | 103 | 36.71 | 62.8 | 44.7 |

* Approximated.

per cent.; November, seventy-one per cent.; February, seventy per cent.; September, sixty-nine per cent.; January, May, and December, sixty-six per cent.; June, sixty-one per cent.; and March, fifty-six per cent.;—or, that the least amount of sunshine in any month is in March, when fifty-six per cent. of the possible prevails. The least amount of sunshine here is greater than the annual average amount prevailing all over that portion of the United States east of the Mississippi River and north of a line drawn on the latitude of Omaha. On an average throughout the year, eighty per cent. or more of the possible sunshine prevails at San Diego from eleven A.M. to five P.M.

The summers of Southern California seem to be little understood. So much has been written about the winters and so little about the other periods of the year that the general impression is that

Southern California is simply a winter station. This false conception of the true conditions does not have much opportunity for correction, because the great mass of travel, both invalid and tourist, usually occurs in winter. Few except the permanent residents know of the beauties of a Californian sea-coast summer.

The days are characterized by a constant sea-breeze which blows with astonishing regularity; it is rarely too warm for comfort, like the days at Cape May, Atlantic City, Long Branch, or other popular Atlantic coast resorts.*

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* The following table shows the winter and summer variations of the ocean's temperature upon the Atlantic coast as compared with the Pacific: Lindley and Widney.

| | January. | July. |
|---|---|---|
| New York | 33.3° | 72.4° |
| Savannah | 49.9° | 84.5° |
| San Francisco | 52.1° | 59.0° |
| Long Beach | 60.0° | 68.5° |

The nights are always delightfully cool. The mid-day temperature varies from 65° to 85° F., rarely the latter, and usually from 74° to 78° F. Those of us who live on the coast consider this the most delightful season of the year. But as it is the period of absence of rainfall, there is a consequent dryness and barrenness of vegetation, and it is now that the hills assume their rusty dusty brown. As far as vegetation is concerned, it is the analogue of the Eastern winter.

The interior valleys, however, present a very different state of affairs. Here the summer temperature is not unusually 95° to 100° F., and sometimes reaches 105° F.; but this, again, is not the same 105° F. as that on the Atlantic coast. Owing to the slight humidity one's sensations are very different indeed. The striking dryness of these regions is most remarkable, and

extends even to the coast, which has undoubtedly, as I have before mentioned, the dryest marine climate of which we have any knowledge.

Several times during the summer the so-called desert spells occur. This is when the land-breeze or wind from the desert, many miles in the interior, gains ascendency over the prevailing western or ocean breeze. During this time the thermometer is apt to show a very high registration. Under these conditions I have seen it at San Diego register 98° F., for only a few hours, however, and in the interior reach 110° or 112° F. The "desert wind" lasts usually only two or three days, but is extremely disagreeable and exciting, owing to its absolute dryness and peculiar electrical condition. The nights during this unusual rise in temperature are always cool and pleasant; one never experiences the sleepless, tossing nights

of the humid East.* These are the only evenings upon which one may sit out of doors with entire comfort and without sensation of chill; this evening chill is one of the peculiarities of our climate, and is somewhat disappointing to the new-comer.

The peninsula of Coronado has a true marine climate. It is a narrow strip of land twelve miles long, and varying in width from a few yards to two miles, and gives San Diego its magnificent land-locked harbour. Its climate is very similar to that of San

* It is not within the province of this little book to inquire into the laws which govern climatic conditions, or to offer the explanation of the Kuro Siwo current or the in-shore trade or counter-trade winds that give California its peculiar climate, but rather to state the conditions as they exist, leaving the reader to the more pretentious works on climates and medical climatology for fuller information on these subjects.

| | Boston. | Baltimore. | Atlantic City. | Coronado. | Los Angeles. |
|---|---|---|---|---|---|
| July 1 | 78 | 73 | 73 | 69 | 77 |
| July 2 | 72 | 77 | 73 | 68 | 75 |
| July 3 | 77 | 80 | 74 | 70 | 73 |
| July 4 | 71 | 76 | 77 | 67 | 75 |
| July 5 | 78 | 71 | 68 | 67 | 82 |
| July 6 | 74 | 83 | 71 | 68 | 85 |
| July 7 | 83 | 86 | 76 | 68 | 84 |
| July 8 | 85 | 83 | 77 | 67 | 78 |
| July 9 | 78 | 90 | 74 | 67 | 77 |
| July 10 | 75 | 75 | 88 | 67 | 75 |
| July 11 | 68 | 69 | 75 | 66 | 74 |
| July 12 | 78 | 78 | 70 | 65 | 76 |
| July 13 | 72 | 82 | 72 | 66 | 80 |
| July 14 | 71 | 76 | 73 | 71 | 82 |
| July 15 | 69 | 74 | 77 | 75 | 83 |
| July 16 | 69 | 82 | 73 | 72 | 81 |
| July 17 | 66 | 90 | 74 | 69 | 81 |
| July 18 | 82 | 92 | 77 | 72 | 82 |
| July 19 | 82 | 85 | 85 | 75 | 79 |
| July 20 | 80 | 93 | 75 | 65 | 75 |
| July 21 | 82 | 95 | 78 | 66 | 74 |
| July 22 | 83 | 88 | 81 | 67 | 77 |
| July 23 | 82 | 86 | 88 | 66 | 78 |
| July 24 | 82 | 78 | 84 | 69 | 83 |
| July 25 | 81 | 83 | 75 | 70 | 82 |
| July 26 | 80 | 85 | 75 | 71 | 79 |
| July 27 | 79 | 87 | 77 | 71 | 78 |
| July 28 | 77 | 78 | 76 | 70 | 77 |
| July 29 | 80 | 82 | 79 | 71 | 78 |
| July 30 | 79 | 81 | 75 | 70 | 80 |
| July 31 | 72 | 74 | 74 | 67 | 81 |
| Mean | 77 | 81 | 76 | 68 | 78 |
| August 1 | 71 | 75 | 72 | 73 | 83 |
| August 2 | 73 | 79 | 75 | 70 | 83 |
| August 3 | 79 | 84 | 78 | 71 | 79 |
| August 4 | 82 | 88 | 78 | 68 | 85 |
| August 5 | 86 | 87 | 75 | 70 | 84 |
| August 6 | 89 | 86 | 76 | 72 | 83 |
| August 7 | 80 | 89 | 76 | 71 | 83 |
| August 8 | 84 | 91 | 76 | 70 | 79 |
| August 9 | 84 | 94 | 81 | 70 | 80 |
| August 10 | 86 | 96 | 79 | 69 | 78 |
| August 11 | 79 | 95 | 84 | 69 | 76 |
| August 12 | 73 | 91 | 84 | 70 | 78 |
| August 13 | 73 | 89 | 80 | 69 | 83 |
| August 14 | 79 | 87 | 85 | 74 | 82 |
| August 15 | 82 | 87 | 85 | 71 | 88 |
| Mean | 80 | 87 | 79 | 70 | 81 |

Diego, said to be a little cooler in summer and perhaps a degree or so warmer in winter. Lindley has presented the preceding table in the *Journal of the American Medical Association*, March 21, 1896, which shows the comparative maximum temperature during July and the first fifteen days of August, 1895, in Boston, Baltimore, and Atlantic City upon the Atlantic coast, and in Coronado and Los Angeles upon the Pacific coast.

## CHAPTER III.

### THE CLIMATOLOGY OF SOUTHERN CALIFORNIA. (CONTINUED.)

HAVING considered the climatic peculiarities of littoral California at some length, taking San Diego as a type, we shall now turn our attention to the interior.

The Sierra range of mountains marks the dividing line. But the coast range of this vast mountain-chain begins gradually to disappear in Southern California, so that, in certain localities, the interior is more open to the sea. Widney so well describes this topography that I shall quote from him at length.

"This interior plain in Southern California is made up of the long reach which includes the San Fernando valley, the Pasadena country, the valley of the San Gabriel River, the Whittier foot-hills,

the Pomona and Ontario uplands, the valley of the Santa Ana River, in which lie Colton, the San Bernardino country, and Riverside, and the long plains of the San Jacinto River southward. Unlike the inland plain of Northern California, it is very irregular in outline, branching out in many directions, and often merging almost insensibly into rolling upland *mesas*. This plain, with its irregular windings, is about two hundred miles in length, with a width varying from fifteen to thirty miles. It is smaller than the corresponding interior valley of Northern California, but the reverse is the case with regard to the coast plain. Instead of the narrow rim which makes the ocean frontage outside of the coast range in the northern portion of the State, in Southern California, an extensive plain faces the sea, having a length of about one hundred and fifty miles, and a depth varying from fifteen to twenty-five miles. This does not include the long valley of the Santa Clara and San Buenaventura Rivers, which fronts on the ocean for some thirty miles, with a depth of about seventy-five, nor the Santa Barbara plain. Between this coast plain and the long interior valley, the coast range of mountains, instead of the continuous chain which it presents in Northern California, is broken and opposite the Los Angeles plains for a space entirely disappears. The whole country, interior valley system as

well as coast plains, becomes thus a great open coast land facing the south, and with the high Sierra for a background.

"The area of the plains of Southern California is really largely increased over their apparent size by the rolling, hilly uplands into which, in many directions, they merge. This is especially the case in a country which lies between the San Fernando valley and the lower Santa Clara valley, and also in the great upland which rises from San Jacinto towards the south in San Diego County. The Sierra, which, north of the so-called Mojave Desert, makes a great curve westward round the south end of the San Joaquin plain of the central belt, turns southward again opposite Santa Barbara and Ventura Counties, and, doubling back upon its course, walls in the west end of the desert, then, turning directly eastward, separates the desert from the Los Angeles and San Bernardo plains. Turning southward again, it stands as a wall between the Colorado Desert and that portion of Southern California lying west of its base. The range varies in height from five thousand to seven thousand feet, with peaks reaching from eight thousand to eleven thousand feet. While maintaining this great elevation it yet develops one feature which it does not possess opposite the central belt. It breaks down at several points into low passes between the coast and the interior of

the continent. The pass by which the Central Pacific Railroad, on its way eastward from San Francisco, crosses the Sierra, is seven thousand and seventeen feet in elevation. Yet the Soledad Pass, by which the Southern Pacific Railroad crosses the Sierra in Southern California, is only two thousand eight hundred and twenty-two feet; the Cajon Pass, by which the Atchison and Topeka Railroad enters, is about the same height; and the San Gorgonio Pass, by which the Southern Pacific crosses on the road to Galveston and New Orleans, is only two thousand five hundred and sixty feet above the sea. There are numerous other comparatively low passes through the Sierra at the west end of the Mojave Desert, leading towards the sea in Ventura and Santa Barbara Counties, and also through the range south of San Gorgonio. These passes through the Southern Sierra have a marked influence not only upon the climate of the coast portions of Southern California but also upon that of the deserts lying at the east base of the Sierra.

"The Mojave Desert lying beyond those passes which open northward has an area of several thousand square miles with an elevation above the sea of some two thousand feet. The Colorado Desert, which lies opposite the passes leading eastward, is somewhat less in area, and has a portion of its surface three hundred and fifty feet below the level of the sea."

Los Angeles may be taken as a typical inland city of Southern California. It is the metropolis of all this southern country, and is situated about midway between the sea and the mountains, twenty miles from the former, and fourteen from the latter, and about equidistant from San Diego and Santa Barbara. It has grown into a beautiful town, and, in so far as it has reached the size and condition of a large city, has grown away from its suitability as a health-resort for a large class of invalids. Nevertheless, as far as I know, it has the best climate of any city of its size. Its winter temperature shows an average of 52° F. and its summer temperature is in the seventies and eighties. The mean yearly maximum temperature, compiled for a number of years, is 87.3° F., the mean yearly minimum is 43.4° F. The average number of clear days is one hundred and seventy-six, fair days one

hundred and forty, cloudy days forty-nine, making three hundred and sixteen days during the year in which a person could be out of doors. The average number of rainy days is forty-two. During the night and morning the winds are generally land breezes, turning in the early afternoon to fresh westerly sea breezes; there are high winds during the winter, and blustering storms during the rainy season. During the dry season there is an occasional "norther," or hot wind, due to a very high atmospheric pressure in Northern California with a relatively low one in the Southern Californian regions. Fogs are more frequent during the change of seasons, when cooler, moist air comes in from the Pacific Ocean. The soil is generally dry and porous, though some few localities are adobe, or damp and sticky, but the dry soil predominates.

The advantages of this region as a

health-resort are, its dry soil, mild temperature, comparatively low humidity, the number of days when one can be out of doors, and the fact that the altitude and climate can be varied by a few hours' journey.*

Los Angeles is surrounded by a most attractive country, well cultivated, and far in advance of the rest of Southern California. Here are many very good invalid stations, as Pasadena, Sierra Madre, Whittier, San Gabriel, and others; their climate is similar to that of Los Angeles itself. The temperature is less equable than in the sea-coast towns, but it is perfectly acceptable to the average invalid. All the surrounding country has about the same climatic conditions, and varies in elevation from three hundred and fifty to five hundred

* Report of Committee on Health-Resorts, American Climatological Association, vol. xi., 1895.

feet, with an average rainfall of about sixteen inches, having about fifty rainy days, a humidity of sixty-seven per cent., and a mean temperature varying, as we have seen, from 50° to 80° F.; but it must be remembered that all these interior stations show a very high thermometric registration during the summer. The same degree of sunshine is found in the interior as we have recorded upon the coast. Far in the interior the fogs are somewhat less, but for twenty miles and more from the coast they are quite as prevalent and dense as on the coast itself. One escapes them only by retreating far into the interior to the higher altitudes. There we arrive at a condition that is very similar to the mountainous region of the far Eastern States, and also nearly resembles the well-known stations in the Swiss Alps, such as Andermatt, four thousand three hundred and seventy-eight feet, Weisen,

four thousand seven hundred and seventy-one feet, Davos, five thousand one hundred and five feet, and Malloja, six thousand feet. At this altitude we do not find so many of California's peculiar and distinctive charms.

| | Mean temperature of each month. | Mean temperature of the warmest day in each month. | Mean temperature of the coldest day in each month. | Monthly rainfall,—inches. | Relative humidity. | Average velocity of the wind in miles per hour. | Number of clear days in the month. | Number of fair days in the month. | Number of cloudy days in the month. | Normal mean temperature of each month. |
|---|---|---|---|---|---|---|---|---|---|---|
| January . . . | 49.7 | 57.8 | 42.8 | 0.99 | 69 | 4.3 | 24 | 1 | 6 | 52.8 |
| February . . | 50.9 | 56.8 | 45 | 0.76 | 70 | 5.0 | 18 | 5 | 5 | 54.3 |
| March . . . | 53.4 | 62 | 44 | 0.29 | 70 | 5.1 | 17 | 6 | 8 | 55.7 |
| April . . . . | 57.1 | 65 | 52 | 0.24 | . . | 5.3 | 16 | 6 | 8 | 58. |
| May . . . . | 58 | 61.8 | 54.5 | 0.91 | 76 | 4.8 | 11 | 11 | 9 | 59.6 |
| June . . . . | 61.4 | 76.5 | 56 | 0.00 | 68 | 6.0 | 21 | 6 | 8 | 62.6 |
| July . . . . | 62.8 | 69.2 | 69.7 | 0.12 | 78 | 5.1 | 27 | 3 | 1 | 65.9 |
| August . . . | 65.9 | 77 | 60.5 | 0.00 | 76 | 4.2 | 20 | 9 | 2 | 67.2 |
| September . | 65.9 | 78 | 56.7 | 1.36 | 73 | 4.5 | 18 | 6 | 6 | 66.3 |
| October . . . | 62.6 | 75.2 | 56.5 | 0.68 | 77 | 3.3 | 19 | 4 | 8 | 62.8 |
| November . | 57.4 | 62 | 53.3 | 0.07 | 82 | 3.0 | 13 | 8 | 9 | 58.5 |
| December . . | 54.5 | 59.5 | 48.8 | 4.67 | 74 | 4.2 | 11 | 5 | 15 | 55.3 |
| Means . . | 58.3 | 66.7 | 52.5 | 0.84 | 74 | 4.6 | 18 | 6 | 7 | 59.9 |

The preceding table is a synopsis of the weather at Santa Barbara, California, for

the year 1894, and is compiled by Hugh D. Vail from daily observation of temperature as shown by self-registering thermometers, and the movement of the wind as measured by a Robinson anemometer. Santa Barbara is in latitude 34° 24′ 30.7″, and longitude 119° 41′ 22″.

The mean temperature of the year was 58.3° F., being 1.6° below the average; that of the three winter months 51.5°, of the spring 56.2°, of the summer 63.4°, and of the fall 62°. The highest temperature during the year was 94°, on September 15, and the lowest 33°, on January 7. There were but ten days when the temperature rose above 80°: of these one was in April, one in June, four were in August, and four in September. Of the three hundred and sixty-five days in the year, two hundred and fifteen were clear, seventy fair, and eighty cloudy. Rain to the amount of one-tenth of an

inch or over fell on seventeen days. The rainfall for the year was 10.09 inches; that for the season 1893–94, 7.02 inches; while the average annual rainfall is about 18 inches. The mean relative humidity was seventy-four per cent. The prevailing wind during the year was west; and the total movement forty thousand one hundred and eighty-one miles, making the average velocity about four and one-half miles an hour. The greatest movement for any one day was three hundred and eighty-six miles, on January 10, being an average of sixteen miles an hour. The most prominent peculiarities of the past year were light rainfalls, greater cloudiness than usual, and a general uniformity of temperature which was nearly two degrees below the normal.

The Ojai valley, in Ventura County, forty miles east of Santa Barbara, is a typical inland valley, six to eight miles

long, and three to four wide; its altitude is from nine hundred to fifteen hundred feet. The soil consists of gravel, and more or less loam on the levels, a clay subsoil, and considerable adobe, with some alkali. In some places water runs off quickly, or is rapidly absorbed, leaving little dampness. The winter shows temperature extremes of eighty degrees to twenty-six degrees; ordinarily, the record is seventy to forty degrees; summer extremes, one hundred and ten to fifty degrees, ordinarily ninety to sixty-five degrees. The atmosphere is said to be extremely dry, and there is no dew. There are occasional high winds with sand storms; the wind that blows from the north, from the Mojave Desert, creates considerable electrical disturbance. Fogs are infrequent, and, when they do occur, disappear by 9 A.M., with a few exceptions. During the year 1894 there were over three hundred

bright, sunny days.* The average yearly rainfall is sixteen inches.

Pasadena, about twenty-eight miles from the coast, is situated at an elevation of eight hundred to one thousand feet; within eight miles are numerous points varying in elevation from twelve hundred to thirty-five hundred feet. The soil is a sandy loam. The mean average temperature for January is 53.9°; July, 70.2°; December, 58°; August, 70° F. The mean maximum and minimum temperature for December, 88° F. maximum, 37° minimum; for July, 90° F. maximum, 51° minimum. The relative humidity for July is sixty per cent.; December, sixty-four per cent.; September, seventy per cent. From April to September fogs are quite frequent in the early morning, usually disappearing

* Report of Committee on Health-Resorts, American Climatological Association, vol. xi., 1895.

by nine o'clock. The proportion of bright, sunny days is about as in Los Angeles.

Redlands is thirteen hundred and fifty feet above the sea-level, and is in a valley surrounded by mountains of from five thousand to ten thousand feet altitude. The soil is dry, red, deep, and porous, in some places stony. The average rainfall is twelve inches. The summers are hot, but owing to excessive dryness are said not to be oppressive. During the day the thermometer is apt to register 110° F. The winter extremes are from 35° to 80° F., the former on December 12 and 29, 1893, and the latter on December 5 and 6, 1893. Occasional high winds occur, and some fogs which generally disappear during the forenoon.

If one pursues his course farther into the interior, he reaches either one or the other of the two great deserts of South-

ern California, the Mojave and the Colorado. In the latter, in the southeastern portion of San Diego County, is to be found a most remarkable depression in the earth's surface,—the bed of an ancient sea,—known as the San Felipe Sink, or the Conchilla Valley. The deepest part of this depression is three hundred and sixty feet below sea-level, the lowest spot in the United States.*

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* Other places below sea-level are: Sink of the Amargosa (Arroyo del Muerto), in Eastern California, two hundred and twenty-five feet below sea-level; the Caspian Sea, eighty-five feet below sea-level; Lake Assal, east of Abyssinia in the Afar country, eight miles long and four miles wide, seven hundred and sixty feet below sea-level. There are several depressions about six hundred feet below sea-level in this vicinity. The noted oasis Siwah, in the Libyan Desert, three hundred miles west of Cairo, is one hundred feet below sea-level. There are also numerous other depressions in the desert portion of Algeria and at various points in the Sahara Desert. (Lindley.)

This sea-bed is one hundred and thirty miles in length and about thirty miles wide. At Salton, some little distance into the depression, the sun temperature reaches 135° to 160° F., but the humidity is low and the heat is fairly well tolerated. One may here obtain the effects of moderately compressed air. The famous volcanoes are a few miles from this point.

Indio is near the edge of the depression, and is but twenty feet below sea-level. Invalids may select it for a location, as it is on the railroad, and water is supplied by artesian wells. In two hours' time by railway, Beaumont may be reached, twenty-five hundred feet above the sea, and in another two hours the San Jacinto Mountains, from six to ten thousand feet above the sea.

Several years ago water returned to the bed of this ancient sea and gave rise to much speculation among clima-

tologists as to the possible effect that this large body of water would have upon the climate of Southern California. I contributed my quota to this discussion in *The Climatologist* for February, 1892, from which I extract the following: "To us as climatologists the most interesting part of this ancient sea is a valley about sixty miles in length, fifteen miles wide, and almost surrounded by mountains, some of which are of nearly ten thousand feet altitude. It is through this valley that the Southern Pacific Railroad finds its exit after leaving the pass of San Gorgonio. A recent writer has termed it 'The Death Valley,' although from four hundred to five hundred Cohuilla Indians consider it their home. The traditions of these Indians and the remains of ancient fish-traps seem to show that this sink has before been a large body of water, although not within the existence of any living

man. The usual overflow of the Colorado River,* which skirts the sink, has been prevented from finding its way into this sunken area by its outlet into the New River, which, until the extraordinary rainfall of last February, was sufficient; but the unusual precipitation of that month broke down the sand ridges, and the Colorado River began to pour its waters into the desert at the rate of sixteen thousand cubic feet per second, increasing until the flow at Yuma was thirty-five thousand cubic feet per second. The water reached Salton on

* Powell, of the United States Geological Survey, says that as the delta at the mouth of the Colorado bridges the great trough from side to side, and as the river, in the building of the delta, has shifted its course from place to place, it cannot be that it has always as now flowed southward to the Gulf. Part of the time it must have turned westward to the Cohuilla basin. Whenever it has turned to the southward the lake, having no other tributary, has died away, leaving the basin as we know it now.

June 22 of the present year (1891), and now, as I write, the sink is covered with a vast expanse of water, one hundred and forty-five square miles in area, and from two to six feet in depth, while in a few places it reaches the depth of fifteen feet. The traces of the old sea show a depth of eighty feet."

At the present time much, indeed most, of the water has evaporated or receded into the river, and the valley is almost dry.

A very good article just published by Gaillard, Corps of Engineers, U. S. A.,* who was stationed here in San Diego, and was a member of the International Boundary Commission, United States and Mexico, states that it will be a surprise to many to learn that our own California desert holds the world's record for extreme heat,—128° F. in

* The Cosmopolitan, October, 1896.

the shade, at Mammoth Tank, a point in the desert twenty-five miles north of the international boundary-line,—a record far in excess of any other ever observed at any regular weather bureau station in the United States. Death Valley, California, is not very far behind: it has a record, taken in 1891, of 122° F.

The following table is a comparison of our desert with other well-known high-temperature locations. It is from Harrington's Report on the Climate and Meteorology of Death Valley, California:

| STATION. | MAX. TEMP. FAHR. |
|---|---|
| Mammoth Tank, Colorado Desert, Cal. . . | 128.0° |
| Pachpadra, Rajpootana, India . . . . . | 123.1 |
| Jacobabad, Sinde, India . . . . . | 122.2 |
| Death Valley, California . . . . . | 122.0 |
| Dera Ismaeel Kahn, Punjab, India . . . . | 121.5 |
| Hyderabad, Sinde, India . . . . . | 121.0 |
| Gardaia, Algerian Sahara, Africa . . . . . | 118.4 |
| Mooltan, Punjab, India . . . . . | 118.4 |

It must be borne in mind that, as Gaillard says, the figures given for the

California and Arizona deserts may be disappointing to some who have heard of extremely high temperatures as common occurrences. These statements, he thinks, are partly due to exaggeration and partly to the effect of intense radiated and reflected heat, and the great difficulty in procuring suitable shade for the instrument. The desert traveller encounters but little shade, and is exposed to the fierce heat of the sun, unless he locates himself at a suitable invalid station, an oasis. The nights are always cool: just before daylight the thermometer may fall as low as 65° F.

I quote from Gaillard: "But it is in winter that the desert is at its best; the air then is clear and crisp, invigorating and stimulating to a remarkable degree, and although at times it is somewhat hot in the middle of the day, yet the nights are perfect and the stars shine with a dazzling brilliancy peculiar to the

desert. It is by no means unknown at this season, and the writer recalls three occasions in March, 1893, when, on the Colorado desert, within thirty miles of Mammoth Tank, water froze in his canteen at night, disproving completely the popular belief that in this region it never becomes cold enough for ice to form. Frost, like dew, is practically unknown, but it is on account of the small amount of moisture in the atmosphere, and not on account of the absence of cold sufficient to produce it."

## CHAPTER IV.

### OUT-DOOR LIFE FOR WOMEN.

SOUTHERN CALIFORNIA is the very land for out-door life, and apart from riding and driving and bicycling and camping there are many occupations and interests which come well within the scope of even delicate women. In fact, a year of healthy country-life in Southern California would do far more to restore many ailing people to health than several seasons spent in sanitariums and cure-resorts. To begin with, one learns to do without hampering luxuries, and one learns to make the best of everything, and, above all, one is generally at a considerable distance from a doctor. These are immense advantages for some invalids, especially for rich ones who have

never known what it was "to have a single wish denied."

A woman can do a great deal of satisfactory and useful work on a ranch. She can pick the lemons, oranges, olives, apricots, or peaches; she can sucker the trees; she can undertake the anxious task of pruning. She can superintend the curing of olives and lemons, and see after the packing and despatching of the fruit.

One girl who came from the East, from a busy life, and had more leisure than she needed here, conceived the excellent idea of starting a strawberry ranch, and has made such a capital success out of it and brought such beautiful fruit to the market that others have been only too glad to follow her example. Another lady has turned her attention to the culture of pampas-grass, and is reported to have won good returns for her labour and outlay. One

hears also of tired-out teachers giving up their school-work and taking to nursery gardening with all its various developments. Amateur gardening is a great resource in itself, and the satisfaction of seeing such quick and rich results from one's efforts is quite indescribable. Given a fair supply of water, one may soon have a beautiful garden around one, with every variety of rose and carnation; wisteria, honeysuckle, plumbago, and stephanotis will grow almost like weeds; in fact, anything and everything will grow as though in fairyland. So that gardening in Southern California does not mean hope deferred making the heart sick; it means something quite unusual in the way of comfort and encouragement, together with the knowledge that one is creating beautiful surroundings for one's home.

With regard to camping, a few words of caution may not be out of place.

Delicate women are likely to come back worse than they were when they started out, unless their men folk are willing to take upon themselves the whole burden of the work, or unless they can afford to have a Chinaman with them, or some other kind of servant, thus giving them the chance to rest and get the good from the open-air life. Otherwise they are always over-fatigued and can enjoy nothing, and would be far wiser if they remained at home.

Walking is not one of the pleasures of out-door life in Southern California. Neither the climate nor the country is suitable for it, although botanists who are strong enough for the exertion scramble about everywhere, searching for treasures and fighting determinedly through the thickly-grown brush; but most of them when possible take a horse or pony, for no one would choose to walk here, if other means of getting

about should be within one's reach. Lovers of flowers can, however, make a very fair and characteristic collection by merely gathering what grows by the roadside, or by just taking a few steps up the slopes and laying hands on anything which strikes the fancy there. But there is no strolling about among shady trees and by the side of running brooks; and many people will find this a great deprivation, which it undoubtedly is. Driving is a necessity as well as a pleasure of every-day life; and one soon becomes accustomed to going for miles and miles over roads which after a dry season are full of "chuck-holes." Nothing could be more enjoyable than starting out on a typical Californian day, with a nice little team and all the dogs scampering along joyously, and plenty of provisions and a fierce determination not to return until you feel inclined. The sense of freedom is delightful, and

moreover the most delicate invalid need not be afraid of these expeditions, and will find that the more she drives the more she can drive, for there is some curious life-giving power in the air which prevents over-exhaustion and aids quick recovery from ordinary fatigue.

On account of the many interests and occupations inseparable from country-life in Southern California, all of them enticing one into the open air, one feels more than justified in urging visitors to give themselves the best chances of recovering their health in the country rather than in towns.

## CHAPTER V.

EXPENSES OF LIVING—CLASS OF HEALTH-SEEKERS THAT SHOULD COME TO SOUTHERN CALIFORNIA — CLOTHING — METHOD AND TIME OF ARRIVAL—LIFE TO LEAD—AMUSEMENTS, OCCUPATIONS, AND BUSINESS OPPORTUNITIES.

CALIFORNIA of the South is not the country for a poor invalid.

One must not come here seeking health without sufficient means for himself and his family, or care-takers. I have seen so much distress and suffering on this account that I wish to speak plainly. It is useless to strive after health without placing one's self under the most favourable conditions to attain that object. Everything that an invalid requires is expensive here, much more so than in the far East. One *can* live

very cheaply, but only by denying himself the comforts and luxuries which are essential to the well-being of an invalid. California has never recovered from the conditions incident to the discovery of gold within her borders; money is comparatively easily made and is quickly spent.

There is little trade competition, and, in consequence, prices are maintained at an arbitrary standard. Coal, wood, gas, water, ice, groceries, and all manufactured articles, command a price that is far in excess of New York, Boston, Philadelphia, or Baltimore. On the other hand, vegetables, meat, milk, butter, and some fruits are very cheap. Horse-hire is within the reach of modest purses. The wages for domestic service are absurdly high, and the service very inefficient; if we exclude the Chinese and Japanese, who are not acceptable to the majority, there is practically no ser-

vant class. House-rent is altogether too high. If one lives in Philadelphia, let us say, in a certain style for a certain sum, and wishes to come to Southern California for residence, it is safe to calculate that it will cost him about forty per cent. more than in his Eastern home if he wishes to maintain the same mode of living. It is a curious fact that notwithstanding these conditions the rates in the first-class hotels are not as high as in similar houses in the East.

Almost all classes of invalids will find a suitable climate somewhere in Southern California, but the individual himself must hunt for it. A rather extended experience in these matters, both personally and professionally, has convinced me of the inability of the medical adviser to select absolutely and with certainty the proper climate for each patient. The personal factor is too strong, and one's likes and dislikes must

be consulted. Let him take to heart Braun's trite remark, "We must consider not only the individual sickness but the sick individual."

Speaking broadly, persons suffering from any of the following conditions will find certain locations in Southern California to be useful aids in restoring them to health,—incipient or early phthisis or tuberculosis in any form, chronic pneumonia or a tardy convalescence from either pneumonia or pleurisy, diseases of the liver following malarial poison, cirrhosis of the liver, simple congestion or hepatic catarrh, jaundice, functional disturbances, and organic ills in those of advanced years and weak or poorly-nourished children, children subject to one of the various diatheses, as the strumous, rachitic, or tubercular. The overworked and overworried class will find here a most soothing climate to regain their lost

energy or restore the nervous system to its normal equilibrium.

My advice to the health-seeker who is independent both in time and money is to come to California in April or May after the rains are over. Let him remain during the summer on the coast, the climate of which is pleasanter, by the way, than that of any of the Atlantic coast resorts; let him study the country, become accustomed to the very different conditions here, and be ready to obtain the full benefit of the winter after having recovered from the fatigues of the journey. Those who cannot devote so much time to the trip will do well to start for California before the snows occur in the East, thus avoiding the danger of blockades which are disastrous to many weak persons who never recover from the exposure. Pulmonary invalids especially and sufferers from circulatory disturbances, or those weak-

ened by disease, should on this account select the southern route.* It is monotonous and unpicturesque, but free from high altitudes, and it crosses a country whose climate is rarely objectionable in winter. To those who are able to stand an altitude of nearly eight thousand feet, the Santa Fé route affords perhaps the most comfortable and quickest mode of reaching Southern California. This necessitates, however, starting from Chicago or Kansas City, two towns not particularly well adapted climatically to the needs of a delicate invalid. The writer has been a somewhat extensive traveller and feels it but just to testify to the uniform excellence of the Hardy restaurant and dining-car system of this railroad.

The invalid who is not a sufferer from

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* Southern Pacific Railroad from New Orleans to Los Angeles.

diseased heart or lungs is practically at liberty to select any route he fancies, and as this little treatise is not a guide-book, he is referred to the various agencies of the different cross-continent systems. The most picturesque routes are the Canadian Pacific and the Denver and Rio Grande. Many and varied combinations of routes may be selected, and much that is remarkable and interesting visited *en route*, if one has the strength, for example, the Yellowstone Park, the Yosemite Valley, and the Grand Cañon of the Colorado.

The advisability of an uninterrupted journey from the far East to California, or of the trip made in easy stages as the fatigues and monotony seem to demand, is to a certain extent a personal matter, and no one can decide it but the individual himself. Some, indeed the majority of invalids, do much better by pushing on to their journey's end, while

others seem to require one or more nights' freedom from the discomforts and lack of ventilation of the sleeping cars to preserve them from actual harm instead of benefit. All invalids, no matter how they may take the trip, arrive in California fatigued and exhausted. This requires several days, and in some instances several weeks, to overcome. For this reason one must be prepared to suffer a little loss of ground when first coming to his health station. This loss is usually only transitory, and is generally followed by a rapid gain. If the location be a suitable one this gain will be continuous and in many instances permanent.

It is perfectly foolhardy to leave one's home for only a few months in the winter season and expect to find a magic cure in the climate either in this or any other resort. No happy results will be obtained unless the residence is

continuous for at least a year. Understand me, I am referring, of course, to cases where so-called organic disease exists.

The sea trip by way of the Isthmus of Panama is advised only in a small number of cases, and the home physician must determine the proper subject for this tedious journey. It is very long, and in the tropical regions extremely hot, and the steamers are not under very good discipline. It is certainly not a trip that a woman should take alone.

I am often asked what kind of clothes one should bring to California. I invariably answer, just such clothes as are worn at home, and all the various thicknesses and weights that the invalid is accustomed to there.

We have already remarked upon the great contrast in all semi-tropic places between sunshine and shade, and mid-

day and midnight. It is this contrast that will oblige the new-comer to use great caution in making any change in the weight of clothing until he has become thoroughly accustomed to all the conditions he will find in our land of many climates.

New-comers from the furnace-heated houses of colder climates constantly complain of the chilliness of our winter air, a sensation no longer experienced by the older residents. While these strangers are thus complaining bitterly of the cold, the tenderest flowers are blooming luxuriously. This is of course no more peculiar to Southern California than it is to all semi-tropic countries.

As soon as possible, the health-seeker must settle down in a proper and suitable locality, and remain there until improvement begins or is fully established. It is a great mistake for him to move rapidly from place to place seek-

ing an imaginary climate and blaming all climates because he is ill or does not recover as quickly as anticipated. It is much more reasonable to lay some of the blame to the disease itself which has brought him to California. He must investigate patiently and impartially the selection of a climate which at first may not be the proper one, or, perhaps, the time too short since his arrival to draw any conclusions. At all events, he must not decide at once that he has chosen the wrong environment because his disease, whose life-history has probably been of many years' duration, does not immediately improve. Disease is self-limited, and the only effect that we look for from a good climate is the increase of tissue-resistance, and the development of that peculiar something in the tissues which is inimical to disease. In other words, it places one in such a condition that

nature asserts her functions in a healthy way, and the diseased processes are gradually replaced by healthy action.

After having selected the climate, and made sure that his selection is a happy one, the new-comer should secure a properly constructed house and surround himself with all the conveniences and luxuries his means will allow. The most sensible house for this country is one modelled after the style of an East Indian bungalow, a one-story structure with overhanging eaves and wide all-day sun-porches. It must face south and east. Here, too, the porches must be placed, protected on their western extremity from the prevailing winds. Upon this porch the invalid is literally to live as many hours as his strength or the weather will permit. I have a medical friend at one of the inland stations who lives day and night on such a porch, the sleeping portion of

which is enclosed in fine netting. One need have no hesitation about sleeping or living on the ground floor; there is practically no soil dampness in the place where he should build his house.

The invalid must realise a few cardinal points. First, in-doors is little different in Southern California from other parts of the world, and if he houses himself he would far better have remained at home. If a hotel is his choice of residence, he must not lounge about the ill-ventilated, over-heated offices, full of tobacco smoke and germ-laden air. The man who comes to this country and continues his club-life, the daily round of cocktails, cigars, and cards, without out-door exercise, had better return at once; his stay here would be useless. I have in mind such a man, who, last winter, could find nothing in Southern California that was praiseworthy, but everything as it should

not be according to his standard. He was viewing Southern California through the smoke-impregnated air of a hotel-lobby.

Again, one must not expect to find the comforts in housekeeping or hotel-life that could be obtained in an older civilization. This is a pioneer country, and we are the pioneers. The man who is not willing to relinquish some of his luxuries must not seek health in California of the South.

The key-note to a healthy existence here is out-of-door life. One must practically live in the open air. This can be easily brought about, as most of the locations that are considered health-resorts have from two hundred and sixty-five to three hundred and sixteen days on which an invalid can be out of doors from morning till sundown. Even during the long storms of winter the clouds often break, the rain ceases,

and one may spend a few hours of the day in the open air.

Tent-life in Southern California is peculiarly agreeable, if one does not mind the dust, because no provision need be made for rain-storms during eight months of the year. From April to November one may camp with the certainty of finding good weather every day. Camps may be located at any point from sea-level to extreme altitude, and the various climatic conditions selected as detailed in other chapters. House-wagons are serviceable, and provide a very enjoyable way of seeing the country and regaining health. If one loves nature, there is much to entertain and absorb in this country; indeed there is little else. Man has not accomplished much here; the country is too vast, and too thinly settled.

The larger cities and more pretentious towns have good theatres and music-

halls, but first-class attractions are rather scarce. There is but little club-life, as we understand it in the older cities. A few localities have endeavoured to establish country clubs, but as yet they are not very successful. Riding-horses are low-priced, and livery is comparatively very cheap. On the coast, excellent fishing, sailing, and yachting may be enjoyed the year round. San Diego has the only good harbour on the southern coast, but the roadsteads at Santa Barbara and Catalina are practically good enough for pleasure sailing. The shooting is excellent; quail, duck, snipe, curlew, mountain quail, and plover are among the small game which are plentiful. In the mountains deer may be found, and occasionally bear is seen.

The occupations and business opportunities in Southern California are neither plentiful nor varied. The coun-

try is distinctly agricultural, but even agriculture is not well developed. It is in an experimental state. The manufacturing industries are hardly represented at all, on account of the scarcity of water and the absence of coal and iron. In the cities and small towns one is confined to the trades and occupations which supply the inhabitants with the usual necessities and comforts of life. One who is obliged to gain his livelihood in Southern California must depend upon one of these occupations or turn his attention to agriculture.

The professions are greatly overcrowded, more so, I think, than is true of other parts of the world, due to the fact that professional men who break down from overwork are continually coming to this country as health-seekers, and after regaining their health never go home.

# CHAPTER VI.

## TUBERCULOSIS AND DISEASES OF THE RESPIRATORY SYSTEM.

BEFORE beginning the study of climate for the consumptive, it is perhaps as well to obtain a clear idea of just what is meant by the term consumption. This has popularly come to mean pulmonary phthisis, but this term no longer represents a specific pathological condition. It is rather loosely applied to a number of more or less chronic inflammatory processes in the lung.*

* "Of the sixty-three million people living to-day in the United States, nine millions or more will, unless something be done to prevent it, die of tuberculosis. In the census year of 1890, one hundred and two thousand one hundred and ninety-nine deaths are reported as due to pulmonary tuberculosis or consumption. To the reported deaths not less than

Most observers of to-day are agreed that the following classification is as nearly accurate as our present knowledge allows:

1. *Pneumonic phthisis*,—a destruction of the pulmonary tissue through casea-

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thirty per cent. should be added in order to arrive at the actual number. When this computation is made it will be found that the annual number of deaths in this country from pulmonary tuberculosis amounts to nearly one hundred and thirty-three thousand; add to this the deaths from tuberculosis of other portions of the body, and without exaggeration we may state that the tubercle bacillus is responsible directly or indirectly for not less than one hundred and fifty thousand deaths in this country each year." —Victor C. Vaughn, M.D., of Ann Arbor, Michigan, in the *Medical News*.

Otis states that if we take the minimum estimate put upon the economic value of a human life, three million nine hundred and thirty-five thousand dollars are lost to the State of New Hampshire alone by the ravages of this disease. It is a simple problem to apply this to the entire United States, when the total becomes appalling.

tion or cheesy degeneration of the inflammatory products in the lung, and the subsequent softening or the breaking down of the caseous deposits.

2. *Tubercular phthisis*,—a progressive inflammatory change in the lung-tissue, accompanied by the presence of the bacillus tuberculosis, a tubercular deposit in the lung parenchyma with a subsequent or concomitant degeneration of the tubercle and adjacent pulmonary tissue.

3. *Acute phthisis*,—sometimes called acute miliary tuberculosis, in which there is a rapid bacillary invasion and a deposit of the gray tubercle granule throughout the entire body, but especially in the lungs.

4. *Fibroid phthisis*,—an inflammatory hyperplasia of the lung parenchyma, subsequent cirrhosis, atrophy and degeneration of the vesicular structure.

It seems hardly necessary at this late

day to call attention to the contagiousness of tuberculosis, and were it not for the fact that I constantly meet people who come to California for health and do not or will not believe that such is the case, I should pass the matter in silence, but for this reason I quote the following: "I should for obvious reasons dissuade the occupation of the same bed or even of the same sleeping apartment by two persons one of whom is known to labour under pulmonary consumption." (Sir Thomas Watson.)

Fuller has this to say on the subject: "It behooves the physician to warn the patient's friends of the dangers incident to long-continued attendance on him, especially if the disease be in an advanced stage. It would be the height of imprudence for a healthy person, especially if young and of a scrofulous diathesis, to sleep in the same bed or even in the same apartment with a consump-

tive patient; for although the malady might not be communicated directly from one to the other, unless possibly under the conditions of some tubercular matter being accidentally introduced into his air-passages or into some other part of his system, *the surroundings and the air would be calculated to predispose him to the disease.*"

It will thus be seen that a very important duty of the physician is to suggest an intelligent prophylaxis which will maintain the normal mechanism in a state to repel a bacillary invasion and to make possible a spontaneous recovery. The great desideratum in the climatic treatment of consumption is to have the invalid leave home soon enough and reach the selected locality before the disease has made any advances. It is now usually possible, by the microscopic examination of the sputum, to determine very early in the

case whether or not we are dealing with consumption in its gravest form—the bacillary—or simply some of the other pulmonary diseases whose import is far less serious. Just here, however, we may encounter a serious difficulty; the disease may develop without giving rise, for a time at least, to appreciable manifestations. Indeed, the disease may have progressed to a very considerable extent without having become outwardly apparent. All of us engaged in the study of this subject have long observed that tuberculous changes are sometimes found after death, where, during life, the individual was seemingly entirely free from such lesions. The German observers are so impressed with this fact that they have stated that every one ultimately becomes infected with tuberculosis.

In order to give rise to constitutional manifestations it is necessary that the

multiplication of the bacilli and the generation of toxines reach such a degree that the accumulation finds entrance into the circulation. Maragliano (*Berliner klinische Wochenschrift*, Nos. 19 and 20, 1896) says that when tuberculosis is present without subjective or objective symptoms, the latency may pursue one of three courses: (*a*) it may persist indefinitely; (*b*) it may be limited in duration; (*c*) it may be intermittent in occurrence. When the first condition exists, persistent latency, infection is beyond the range of certain detection, the normal processes of nature (auto-therapy or auto-serumtherapy) controlling the advance of the disease. If the latency is limited in duration the infection suddenly makes its appearance. These are the cases where hemorrhage from the lungs suddenly occurs without apparent previous symptoms, and causes much amazement to the patient and his

friends. Another group of cases also occur under these conditions, those in which tuberculosis suddenly shows itself in connection with some acute infectious disease, such as typhoid fever.

When one passes the border-line from latent to manifest tuberculosis one of two things has occurred, either increased infection or a diminished resistance, possibly both.

There is another form of latent tuberculosis which has recently been classified as larval tuberculosis, and subdivided into two types, dystrophic and typhoid. In the first the patient gives pronounced evidences of disturbed nutrition; he has the symptoms which are popularly known as dyspepsia,—namely, progressive failure in strength, an enfeebled heart and pulse, lost or impaired appetite, debility, mental depression, and anæmia. Fever is rarely present, and physical signs, if they appear at all,

occur very late in the disease. The second type, the typhoid form of larval tuberculosis, is characterized by the early occurrence of fever, which is at first intermittent and then remittent. Derangements of innervation appear very early, although the general strength may be maintained. Attacks closely resembling typhoid fever occur from time to time. The greatest care is required to make the diagnosis of larval tuberculosis, and, as it is not our object to consider the methods of clinical medicine, we shall refrain from discussing abstruse problems. Suffice it to say that the diagnosis can be made by intelligent and painstaking observation.

When the existence of consumption is recognized early, and the patient is immediately sent to a proper climate, I see often some most remarkable restorations to health. I have two such instances in mind, of young medical men

in whom the infection was detected at once; one received his in a large city hospital and the other in a bacteriological laboratory. They came to California, were placed in a suitable climate, lived a proper life, and within a year the bacilli had entirely disappeared, and the men presented every rational and physical sign of complete restoration to health.

Another great class of people who will derive marked benefit here are those in whom it is impossible to demonstrate the existence of actual disease in the lung (latent and larval tuberculosis), but who are weak, ill nourished, take cold easily, are subject to attacks of winter cough and bronchitis, and whose family history points strongly to the ultimate consumptive breakdown. These individuals present an inherited, or, if strumous or rachitic, an acquired, predisposition to the disease.

These and the very early or incipient consumptive will be considered in the same class climatically. They should come prepared to remain at least two years,—five would be better,—and they must be able to procure everything that aids in the promotion and maintenance of the general health. As I have said before, it is madness to come to California in search of health without ample means to supply all comforts and luxuries.

Whatever impairs the vitality or improperly affects the normal functions of a consumptive must be constantly guarded against. All acute pulmonary disorders should be promptly relieved; affections of the throat and nose, however slight, should be made the object of careful treatment. Most important, indeed vital, is healthy digestion, both stomachic and intestinal. Here is the key-note of success. The pulmonary

invalid who eats well, digests, and assimilates is on the high-road to success.

Any change from city to country is of advantage to the phthisical invalid. There is usually a gain in weight and an amelioration of all symptoms. But the place of residence must be thoughtfully selected, its sanitary conditions and general appointments must be above reproach, the local and meteorological conditions the best that can be found. However, if this gain does not at once occur, one must not conclude that he is immediately to change the location and seek a new climate. Nor is one to sit down in a porch-rocker on reaching the selected locality and wait for a miraculous climatic cure. Here, as in all other relations of life, little is to be gained without labour. The climate unaided will produce little if any benefit at all. The quantity and selection of food must be carefully looked to. Physical exercise

cannot be neglected, and should be adjusted to the needs of each individual. The only two aids which, in my hands, have produced happy results in restoring health are good food and out-of-door life. I do not mean by this a few hours in an easy-chair on the porch, but an out-of-door existence, in many cases for the entire twenty-four hours. Those who come early enough, remain long enough, and lead this life, are almost certain to find what they seek. I have records of too many cases of complete and partial recovery under these circumstances, not to speak very positively on the matter and to feel absolutely sure of my statements. Many of these health-seekers have become my intimate personal friends, whom I see day by day, and whose maladies are cured, arrested, or quiescent.

It is a fact that for eighty years, as Theodore Williams says, whatever

success has been attained in the treatment of phthisis has been achieved by strengthening and fortifying treatment, whether by diet, climate, or medicines, and not by so-called specific treatment.

We must lend aid and support to the organism's inherent power to resist disease. Metchnikoff has acquainted us with some of the powerful weapons with which nature fights the battle of resistance to such bacillary marauders. Our object is to increase the number and activity of the phagocytes (lymph or white blood-corpuscles, regarded as organisms capable of devouring what they meet, especially pathogenic microbes).

Williams considers pure air the most important factor in the treatment; success is largely dependent upon its thorough application to the system of the patient. He recommends an out-

of-door life, and adds that phthisical patients should accustom themselves to open windows throughout the year. The question of occupation or amusement for pulmonary invalids is always an important one. Early in their stay they are better without anything to do, other than taking extremely good care of their health, but as they improve, the life becomes very monotonous, and home-sickness asserts itself most vigorously. The commercial occupations, as I have already said, are few, but, as a rule, the man who resides in Southern California for the purpose of combating the invasion of tuberculosis is much better off without commercial duties; he would do better to seek occupation in agriculture, or, at least, in such a one as will enable him to perform his duties in the open air.

If his means be ample, ranching in a small way will afford both occupation

and amusement, and aid very materially in accomplishing his purpose. If this be not to his taste, he can still occupy himself with out-door pursuits, with his horses, his guns, and his dogs. Yachting, sailing, and fishing, too, will keep him in the open air. The bicycle is to be used only upon the advice of his physician. Under no conditions is he to lead a so-called society life. If he is not willing to relinquish these pleasures, he had better not come here as a health-seeker.

In most cases a permanent residence is necessary to the maintenance of a cure. A majority of cases that receive any benefit retain it only by remaining in California. When the disease has been arrested in this or any good climate, and the individual has returned to his old life, where he again breaks down, he does not the second time make as good a recovery, or possibly he does not re-

cover at all on revisiting California or his selected health-station.

These remarks, of course, do not apply to those who come in an advanced stage of the disease; with these little will be accomplished, except the prolongation of life. I have often been dumfounded at the length to which life is prolonged under these circumstances. We frequently see up and about individuals whose disease is in such an advanced state that they would most certainly be confined permanently to bed in their Eastern homes. It is this peculiar effect of a residence in this climate that seems most striking to the physician himself when first he comes an invalid to this country.

## CHAPTER VII.

### THOSE BENEFITED BY THE CLIMATE.

THOSE who desire a change from the cold, damp winters of their homes, though they may not be ailing, or, indeed, may enjoy good health, will find that Southern California offers them many pleasant and suitable locations. A large class of such people come yearly to this country; it is even quite noticeable how they repeat this year after year.

Convalescents from any acute disease will hasten their complete recovery by coming here, and will be restored to perfect health much sooner than is usual at home.

All catarrhal affections do well in Southern California; it makes little difference whether it be catarrh of the re-

spiratory system, of the gastro-intestinal tract, of the bladder, or, in fact, of any mucous surface, except the so-called catarrhal form of consumption. These invalids, however, must be particularly careful to avoid the unfavourable conditions which exist in our climate. They must constantly bear in mind that they are possessed of peculiarly unstable membranes and that very slight causes will give rise to congestion or inflammation. The sufferer from catarrh of the stomach or intestines can no more abuse with impunity the ordinary laws of dietetics in California than he can anywhere else.

Scrofulous affections, enlarged glands, the soft, flabby muscles of the strumous individual, and the lymphatic or adenoid child, receive a remarkable benefit from long residence on the coast combined with sea-bathing.

Tuberculous disease of the bones is

rare in the native population, and is favourably affected in foreigners by the warm, equable climate and out-door life. These individuals can live in the open air, even if confined to bed, or to the use of the various surgical appliances for rest of the parts or correction or modification of deformities. The little sufferers from Pott's disease or coxalgia may be carried out of doors on their cots in the early morning and not be brought into the house until afternoon, an inestimable blessing.

The sufferers from gout and rheumatism receive great comfort and benefit. The open-air life which they are able to lead is a condition very favourable to recovery. An active skin and pure air are wonderful helps in eliminating the disease.

Those who have abnormal forms of gout and rheumatism, suppressed gout, gouty bronchitis, and the dyspepsia and

anæmia attendant upon these conditions, will also find relief from their pains and an amelioration of their disease. Invalids in this class must also be extremely careful to avoid indiscretions in diet, errors in clothing, damp, fatigue, or chill. Gout or rheumatism rarely develop in this country. I often hear complaints that such is not the case, but that a severe attack of rheumatism has just appeared, much to the patient's surprise and annoyance. Careful inquiry, however, usually elicits the fact that he has had other slight attacks or, at all events, premonitory symptoms before coming to California. Or it may come to light that he has a decidedly gouty or rheumatic ancestry.

It cannot be considered that rheumatic maladies which arise in Southern California among the native population, or those long resident here, are the result of any climatic conditions. The specific

originating cause of rheumatism is still under discussion. It is but fair to suppose that our climate presents nothing in itself which will retard the operation of this cause within the individual, just as the bacillus tuberculosis is not exterminated by climate.

Those who, in addition to the ordinary manifestations of rheumatism, show a peculiar susceptibility to changes in the weather, and, like the West Point professor, are slaves to the clouds, also those who are neuralgic with or without rheumatic taint, will find almost entire immunity from their tortures somewhere in Southern California. The exact location they must decide for themselves by personal experience.

Persons having diseases of the kidneys, particularly the granular kidney, will find our climatic conditions very favourable to their comfort and well-being. In this connection I will quote from my

paper contributed to the *Climatologist* some years ago. "It appears, then, that a residence in a suitable locality, while it will not of course arrest well-marked kidney lesions, will at least prolong life to a degree far beyond the natural expectancy. The constant skin activity, much of which is manifested as insensible perspiration, lowers arterial tension, and depletes in a most beneficial manner, relieving the overtaxed renal circulation and the diseased parenchyma. Furthermore, the patient will be protected from the dangers of intercurrent or concomitant maladies, which are so apt to prove fatal to one with renal inadequacy."

The future will show that in Southern California, from sea-level to two thousand feet, the invalid has at his command the climatic conditions which will prolong his life if suffering from chronic renal disorders; and if the change be

made soon enough, when the connective tissue is yet embryonic, it is but reasonble to suppose that, with decreased tension and active skin, freedom from intercurrent renal congestions, and a constant out-door life, the disease may be arrested or removed. J. C. Wilson and Loomis (*Transactions of the American Climatological Association*, 1889) consider that there is reason to believe that low temperature, rapid change of temperature, and high altitudes are unfavourable, whereas equability and warmth are favourable influences.

Anæmia, except the pernicious form, rapidly improves with us; these invalids speedily grow better and stronger and are more able to lead the necessary out-door life.

People who are afflicted with atonic dyspepsia, the various urinary diatheses, oxaluric, phosphuric, and other troubles of this kind, chronic rheumatic arthritis

or rheumatoid arthritis, will find help from prolonged residence here.

Pneumonia in Southern California is a very rare disease in my experience; it is apt to run a short course and present a speedy convalescence. In Los Angeles County pneumonia appears as a cause in only 2.41 per cent. out of a total of six hundred and sixty-four deaths. The report of the health department of the city of San Diego shows but twelve deaths from pneumonia during six months of the year. Baker has shown by diagrams and tables in a convincing manner that the rise and fall of sickness from pneumonia, bronchitis, influenza, tonsillitis, croup, diphtheria, and scarlet fever are more or less controlled by fluctuations of atmospheric temperature, the diseases being increased by lower and diminished by higher temperature.

Erysipelas is a very rare disease here.

Bullard's statistics show but one death in eleven years, and demonstrate the fact that in all Southern California erysipelas is only about half as frequent as in the rest of the United States.

Advancing years and old age may be robbed of many concomitant infirmities by residence in a suitable locality. The aged are rarely safe in a high altitude; nor can they with impunity change their station from low to high altitudes, more particularly if they suffer from chronic pulmonary disease, bronchitis, bronchiectasis, fibroid phthisis, or the like. A dilated, fatty heart absolutely forbids removal from sea-level. On the whole, a marine climate is preferable for old people, and if it be warm and equable, so much the better, as gout and rheumatism may be warded off, or, if these be already present, the severity of their manifestations may be lessened.

Cystitis, so often an attendant on ad-

vanced years, and so apt to be aggravated by damp, changeable weather, will be markedly benefited by our warm, equable climate.

Insomnia, the plague of the old, and sometimes the torture of the young, will find most speedy relief on the coast. Indeed, the writer has observed most gratifying results in this respect after a sojourn of even a few months.

This country is a veritable paradise for the growing child. There is no period during the entire year when it is necessary to house the little ones. There are no badly ventilated, overcrowded, or overheated rooms. The zymotic diseases are usually not at all prevalent. They are mild, run a very favourable course, and are generally followed by complete recovery. The scrofulous child lives under the most favourable conditions to combat the inherited taint.

## CHAPTER VIII.

### THOSE NOT BENEFITED BY THE CLIMATE.

CERTAIN diseases of the nervous system are not particularly benefited by a residence in Southern California. The chronic paralytic will be able to lead his remnant of life in the open air instead of in furnace-heated rooms, but he must not expect any curative effects from the climate. The dry electrical conditions of the interior seem to aggravate the pains of early spinal sclerosis or locomotor ataxia. They do fairly well on the coast, but with these, again, climate is of little avail.

Cases of neurasthenia that have reached the stage which it is now fashionable to call terminal neurasthenia are better away from Southern California;

the head pains may be aggravated by the dryness and constant sunshine. Such patients do better in a more humid and colder locality. They always complain bitterly of the "desert winds."

I have never been able to see that epileptics are aided in any way.

Hemorrhagic cases of tuberculosis should, if they come to Southern California, select a moderate elevation somewhat removed from the coast.

The so-called catarrhal forms of pulmonary disease, the catarrhal phthisis of the older writers, the phthisis florida of the more recent observers, are apt to do badly in any climate; the best location for a large number of these patients in Southern California is at an altitude between fifteen hundred and eighteen hundred feet.

Some patients with laryngeal phthisis find the humidity and winds of the coast very trying; they also complain

of the dry heat of the interior, so that for them at least Southern California offers no suitable home.

Other consumptive patients find Southern California entirely unsuited to their particular malady. They lose flesh, have fever and night-sweats and hæmoptysis. The temperature changes, the difference between sunshine and shade and mid-day and midnight, and the fogs, all affect them unfavourably. They are unsuited to a semi-tropic station.

I find that certain skin diseases, notably eczema, are affected unfavourably by a residence too close to the sea. I have never observed that "fibroids," cases of cirrhosis of the liver, or gastric ulceration show any particular tendency to hemorrhages in this country. They are no more apt to bleed here than elsewhere.

Some cases of rheumatism find the

coast and the interior unsuited to their form of the malady, and are obliged to seek other health-resorts. Asthmatics, whose disease is most peculiar in its climatic relations, must try this climate personally for a sufficient time before it is possible to decide upon the desirability of remaining here or selecting another and totally different climate. Persons suffering from this disease often find entire immunity by a change of only a few miles, or, indeed, in some instances, by a change from house to house in the same town; others will travel the world over and fail to find relief.

It is almost impossible to lay down a hard and fast rule and say with absolute certainty who will or will not receive benefit by coming to California. We must consider the individual case. We frequently meet with patients who seem unsuited, but nevertheless gain much after residence here. These exceptions

do not, of course, affect the general deductions, but simply serve to show that in many instances a personal visit of the invalid will alone decide the matter.

THE END.

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